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LESSONS FROM THE SICILIAN CAMPAIGN

The digest of combat experience and battle lessons from the Sicilian Campaign contained herein is published for information and guidance in the training of the command.

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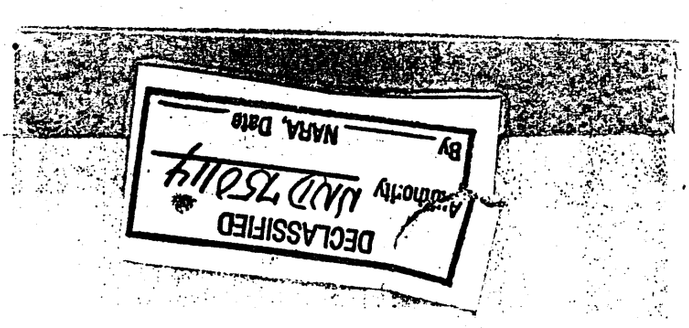

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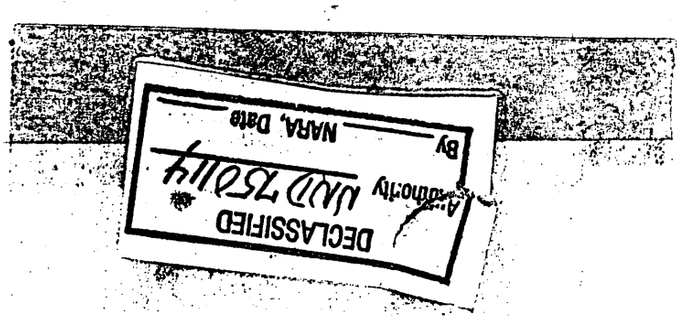

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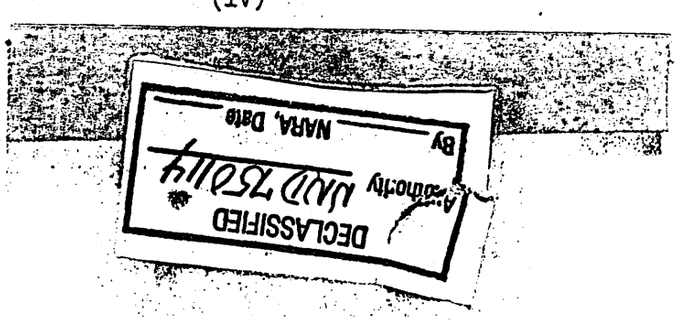

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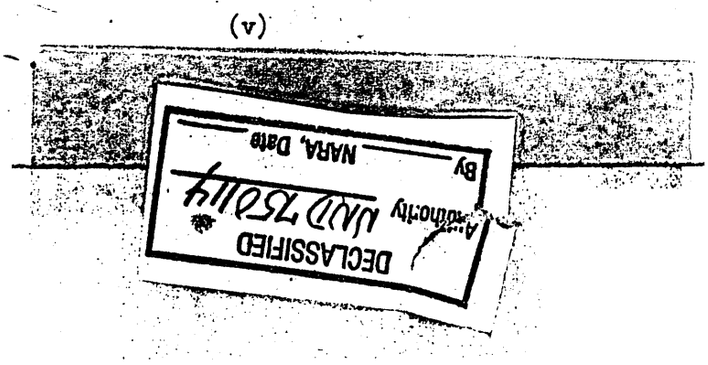

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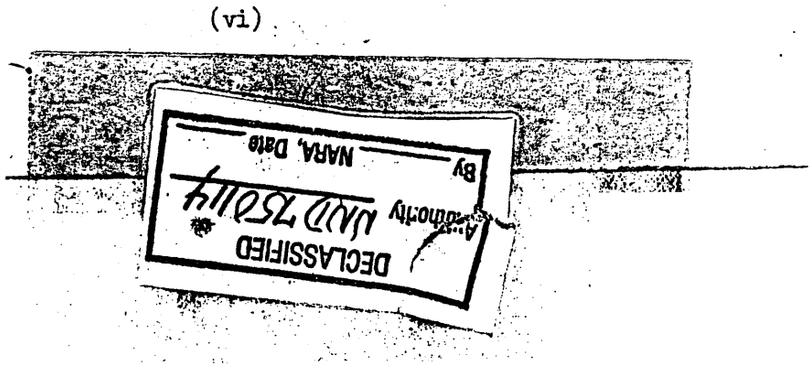
"Since the capture of MESSINA I have had the opportunity of examining many of the battlefields from the side of the enemy. As a result of this, I am more than ever impressed with the self-sacrificing valor, endurance, and resourcefulness of the American soldier. He is a peerless fighting man."

--Lieutenant General G.S. Patton, Jr.,
Commanding General, Seventh Army.



LESSONS FROM THE SICILIAN CAMPAIGN

SECTION I : INTRODUCTION

1. The material contained in this publication is not to be considered as tactical doctrine. It represents a summary of the major lessons from the land operations of the Sicilian Campaign, digested from reports of the Army Commander, Corps and Division Commanders, and from reports and testimony of lower unit commanders and officers who participated. It is believed that the lessons and examples given herein, if applied with judgment and consideration of individual situations, will be of value in the training of units and individuals who have not yet entered combat, or have yet to experience combat under conditions such as prevailed in Sicily.

2. In all reports and testimony of battle experience the soundness of basic principles prescribed in standard training literature has been confirmed. Detailed study of the land operations in the Sicilian Campaign reveals very little that can properly be called "new" in combat lessons. The application and modification of basic doctrine to meet effectively the peculiar characteristics of the campaign did present a number of interesting and valuable lesson-experiences.

3. The distinctive aspects and peculiarities of the campaign should be fully appreciated in order that the summary of combat experience and battle lessons presented herein may be understood in its proper perspective. For this reason the following section outlining the general nature of the operations is included.

SECTION II : CHARACTERISTICS OF THE CAMPAIGN

4. In general, the Sicilian Campaign consisted of two phases for the United States forces: a large-scale amphibious landing operation, and a mountain campaign. The subject matter of this publication pertains

to the latter only.

5. The Allied operations in Sicily were marked by almost complete air superiority. Except during the initial landing phase, the enemy air activity was almost negligible. This fact, in connection with the limited road net which was used to capacity because of the prevailing terrain, played an important part in the rapid and successful advance of our forces.

6. The campaign of the American forces after the initial establishment and extension of the beachheads was on the whole a pursuit action throughout. The enemy for the most part fought a stubborn rearguard and delaying action, and utilized the terrain, prepared defenses, mines, and demolitions to the fullest possible extent. This special nature of the action is particularly important in any consideration of the combat lessons contained below.

7. The terrain was an important factor in shaping the campaign and the combat experience that resulted. The country fought over was of the roughest kind. Its chief features were high, rocky mountains and hills of volcanic origin cut by narrow and enclosed valleys and dry watercourses. Except for the limited roads, the ground communication throughout this terrain was confined to tortuous tracks and trails. Such terrain as this, encountered throughout most of the island, presented difficulties of movement and transport not generally equalled in the Tunisian Campaign.

8. In almost every sector the road nets were very limited and restricted. In the northern coastal area where German resistance was especially stubborn, communication was practically confined to one road which was flanked on one side by steep mountains cut by tranverse valleys, and on the other by the sea. Over this single road the advance in this sector was forced to move in pursuit of the withdrawing enemy who demolished almost every bridge from PALERMO to MESSINA. The same road had also to serve for communications and supply.

9. The nature of the terrain, together with the lack of parallel, auxiliary, or alternate roads, necessitated many phases of mountain warfare on a scale not hitherto experienced in this Theater. It was necessary in a number of units to adjust certain aspects of organization, maneuver, and supply to fit the situation that the terrain and delaying action of the enemy presented.

SECTION III : INFANTRY UNITS

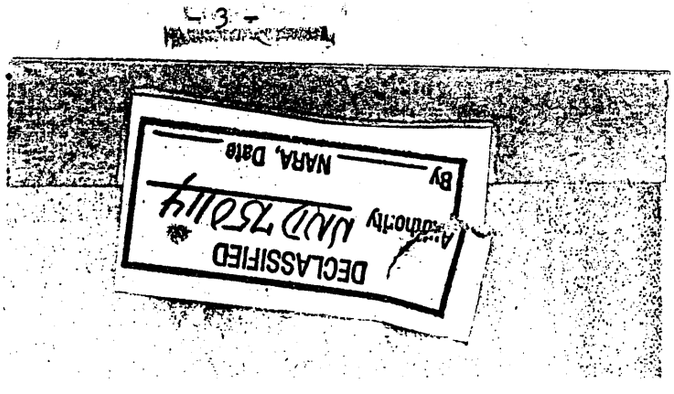
10. GENERAL

a. Mountain Warfare

The major lesson of all arms, and infantry particularly, was the achievement of rapid and successful offensive action in difficult, mountainous terrain under conditions not previously encountered. Three general lessons of mountain warfare were outstanding and applicable to all units:

(1) The ability to withstand the excessive physical strain that continuous mountain combat imposes on foot troops. The nature of the operations demonstrated the necessity for a degree of physical conditioning and hardening not previously realized. Experience in Sicily leads to the conclusion that the training of troops in preparation for such operations must be conducted in rugged hills and mountains. Unit commanders agreed that ordinary hardening marches over relatively flat or rolling country will not suffice for the level of stamina and field hardening required by mountain combat.

(2) The necessity of conducting rapidly advancing infantry operations without the aid of normal vehicular transport for heavy weapons, ammunition, supplies, and rations. The foot troops had to resort frequently to pack animals, hand transport, and to all manner of field improvisation to keep up the vital equipment and supplies as the advance was pushed through difficult and rugged terrain.



(3) A forceful repetition of a major lesson learned in the Tunisian Campaign: the necessity of siezing high ground and the avoidance of natural approaches. The terrain in Sicily brought out this lesson with greater emphasis than before. The securing of dominant terrain for observation, the working of units along high ridge lines and down to force the enemy out of positions in the valleys and at the heads of natural approaches--these principles were of the greatest importance to the success of infantry action.

b. Pursuit Action

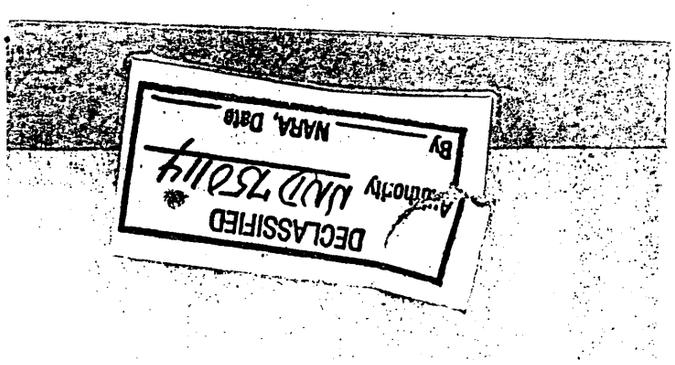
(1) In general there were no "new" lessons from the pursuit aspects of the campaign. After the initial beachheads had been established, the action became a continual advance before which the enemy withdrew, stubbornly fighting from delaying positions which were covered by mines, obstacles, and demolitions. The Commander-in-Chief's personal representative in the combat area described the campaign as

> ". . .a continuous, unrelenting attack. From the time American troops landed on the beach until they entered MESSINA the pressure on the enemy was never relinquished. . ."

Similarly the experience of the 1st Infantry Division was described in the report of its Commander:

> ". . .The Germans and Italians in the 1st Division sector abandoned any attempt to drive the American forces off the island and resorted to purely defensive tactics with only sharp local counterattacks. As a result of this the 1st Division was continually on the offensive while the Germans were defending successive delaying positions covering the withdrawal of troops, equipment, and supplies within the MESSINA bridgehead. . ."

Throughout the advance the principles of vigorous, aggressive action of all units, resourcefulness and determination in the passage of obstacles and mined areas, and the application of constant pressure to deny the enemy time and opportunity for rest or preparation of positions were essential to the action of the infantry. The experience of the 9th Infantry Division was summed up by its Commander, with particular reference to the maintenance of contact in pursuit:



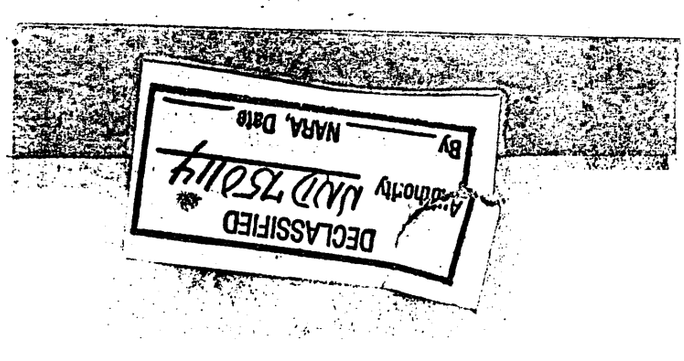
". . .Failure to keep contact during an enemy withdrawal allows time for a well-organized occupation of a previously prepared position. Troops must push forward immediately in spite of mines, and demolitions when contact is lost. Infantry must move forward cross-country removing mines themselves and supplying themselves by mule or light transportation. . . ."

(2) In rapid advance against a withdrawing enemy the need of heavy weapons in the advance guard was recognized early in the campaign. Battalions adjusted their advance formations to meet this need, and successful results were obtained. In one or two instances when unit commanders did not press their heavy weapons well forward in pursuit, unfavorable situations developed. This principle was brought out in the report of the 9th Infantry Division:

". . .The heavy weapons company must be the base of the advance of the entire battalion. Therefore to facilitate the advance of the battalion it must be driven home to those responsible for the organization and equipment of the infantry battalion that the heavy weapons cannot be man-handled and still keep up with the advance of rifle companies. . .whenever pack mules could be secured. . . they were furnished to heavy weapons companies and in such instances the heavy weapons companies had no trouble keeping up with the rifle companies. Whenever the heavy weapons had to be carried by hand, the heavy weapons company usually lagged behind, and in one instance this had serious consequences. One battalion, which had advanced well ahead of its heavy weapons company surprised and took a German position early in the morning. Shortly afterward the battalion, which had only two rifle companies forward, was forced to defend its position against a counterattack without the support of its heavy weapons company. The battalion was driven from the position. . ."

(3) Effective pillbox reduction and town clearing played an important part in the pursuit action. Prior specialized training in these subjects proved invaluable in the campaign. Likewise the passage of towns which were made to serve as obstacles by the withdrawing enemy proved to be formidible tasks in some instances. The best example of this problem was reported by the Commanding General of the 1st Infantry Division:

". . .Contact was initially broken when a town, which had within it the only road through the area, was completely demolished. Mines were found every five or ten feet, all bridges were blown and river beds were mined, craters were blown in roads, and mountain slides were dropped on the only existing supply route. . ."



(4) Throughout the pursuit operations the necessity for the use of oral fragmentary orders was felt, and this medium of directing the action of the lower units was extensively used with good results.

11. TROOP LEADERSHIP AND COMMAND

a. The necessity of aggressive and sustained troop leadership stood out in even bolder relief in Sicily than in previous fighting. In the mountain fighting that prevailed, the difficulties of terrain, supply, and other factors imposed even greater requirements of initiative, responsibility, and resourcefulness on the junior leaders and non-commissioned officers. This subject was thus summarized in the statement of an infantry battalion executive, given the day after MESSINA fell:

> ". . .There must be more. . .training in the elements of initiative and responsibility, in ability to meet unexpected situations, and in acting on sound decisions made on individual responsibility. No one in our outfit expected to meet the situations we encountered in Sicily. In the U.S. the field problems were generally too cut and dried. . .One thing, we have got to stop belittling the fighting ability of the German. The enemy is vicious, clever, and ruthless. It's going to take leadership of the highest order to whip him for good and all. . ."

b. The exercise of command in the immediate scene of action rather than from rear command posts was also a subject of importance in the reports of higher commanders. In this connection the Commanding General of the 45th Infantry Division has stated:

> ". . .Our teachings in peace time have overemphasized the command post and the personnel functioning thereat. As a matter of fact, in the properly led battalion and regiment the command post is improperly named. The commonly understood command post is in reality an information center. The command post is wherever the Commander is located. In this operation (Sicily) the commander who spent much of his time at the command post as we teach it, failed to perform his duties. It must be impressed upon all commanders that their place in combat is at a place where they can observe the fight. No man can be sure of a decision made from second-hand information and a study of a map. The commander should see the ground and he should see the reactions of both friendly and enemy troops. . ."

12. PACK AND HAND TRANSPORT IN MOUNTAIN OPERATIONS

The mountainous terrain and necessity for cross-country operations often precluded the use of vehicular transport of heavy weapons, ammunition, and supplies. As a result units resorted to pack animals, hand transport, and various forms of improvisation to keep up their weapons and the flow of supplies to front line elements. Wherever possible animal transport was utilized; and native mules were obtained locally. The 3rd Infantry Division used 650 of these animals. The necessity of providing for this form of transport organically when operations in mountains are contemplated was emphasized in the report of the Commanding General, II Corps:

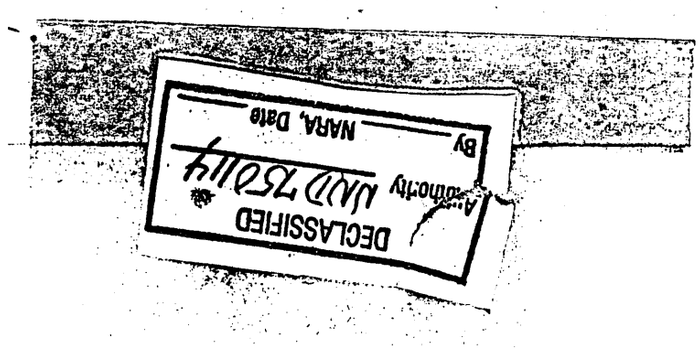
> ". . .Infantry divisions successfully employed pack mules throughout the Sicilian Campaign. . .In contemplated operations in mountainous terrain, plans should include facilities for supply by pack train. A division pack train organized on the basis of a section consisting of about 25 mules with Phillipps pack saddles to support each rifle battalion has proved a necessity in this type of terrain. . ."

The problems and deficiencies as a result of using local and improvised pack trains were pointed out by the Commander of the 9th Infantry Division:

> ". . .Infantry can advance only so far without receiving its daily supplies of water, ammunition, and food. In this campaign, even in the case of infantry advancing along a main road, the advance was temporarily held up due primarily to difficulties of supply. Due to the fact that. . .the terrain was such that motor vehicles could not be used. . .pack mules had to be used. A better solution for transporting supplies, ammunition, and heavy weapons in mountainous terrain must be devised. The time wasted in going long distances by truck to procure mules might well be a vital factor in the success or failure of an operation. A conglomeration of pack equipment was finally collected that was neither adequate nor efficient. Inexperienced packers did the best they could and the drain on manpower to furnish packers and mule leaders was quite heavy. . ."

Experience in the campaign led the above quoted Division Commander to recommend that:

a. Organized pack trains be provided in Corps or Army reserve for any operations where mountainous terrain is to be encountered.



b. When organized pack trains cannot be made available, a stock of American pack equipment should be provided, including special pack saddles for the 75mm mountain howitzer and the heavy weapons of the infantry.

c. Units should be provided with pack equipment and mules on a loan basis during the training period before an operation in order that instruction in packing may be given.

When local mules were not available, or were unserviceable because of overwork, hand transport of weapons, ammunition, and supplies became necessary. Alaskan type pack-boards were often improvised, as well as slings and other methods of hand-carrying. The rigid type frame was found most satisfactory for carrying mortar parts and bombs, and other heavy items. In one instance a human pack train was organized to carry rations to front line elements more than six miles from the ration dump. Each man carried two engineer sandbags filled with K-rations, the bags being tied together and carried front and rear over the shoulder.

13. EMPLOYMENT OF THE INFANTRY SUPPORT WEAPONS

The campaign demonstrated the necessity for proper employment and coordination of all infantry support weapons. The terrain imposed extreme difficulty in weapon operation and ammunition supply, but the lesson that the support weapons are vital, especially in mountain fighting, was driven home to all unit commanders. The Commander of the 9th Infantry Division again reiterated the lesson of his division in Tunisia that "infantry must use their organic support weapons and request artillery support only when resistance cannot be dealt with locally." The Army Commander in his comments on the use of the heavy weapons company has stated:

> ". . .The best practice is for the heavy weapons company to work as a unit under the battalion, to support one or both leading companies, and to provide covering fire for the third rifle company when the latter is used to maneuver. It has been found that in very difficult country the heavy machine gun section of two guns produces better results if one gun is left with the transportation and all members of that gun squad act as relief carriers and

bring up ammunition. The largest number of rounds fired by a heavy machine gun in one day was between 5,000 and 6,000. The high average for the 81mm mortar was 800 in one day. . .There is a case on record where two 60mm mortars fired 1,000 rounds in one day. . ."

Similar practice with respect to the 81mm mortar was recommended in the statement of a heavy weapons company commander who reported that "in mountain warfare like this it is not practicable to carry more than two 81's into the attack. You just can't supply the ammunition for more. It is better to have two mortars firing all the time than to have six for only a short while." The use of all supporting weapons in attack was also mentioned with exphasis by a battalion commander of the 30th Infantry who declared that all officers

". . .must be taught what coordinated attack means--the use of all weapons of all types with proper timing and prearranged preparation. Every means at the commander's disposal must be used, and at the right time. . ."

Another battalion commander in the 180th Infantry expressed similar conviction as a result of his combat experience throughout the campaign:

". . .There must be more emphasis on the training in. . . coordination of the weapons company with the rifle companies. The rifle companies must be better trained to work with the weapons company. In some cases they seemed to forget that they had heavy weapons in support. In one case when a rifle company was forced to fall back, it withdrew behind the mortars. There must be more training in the coordination of all weapons--the combined infantry arms. . ."

Lesson-experiences with the supporting infantry weapons in the 45th Infantry Division were summed up by the Division Commander in his report, which disclosed the excellence of the 37mm gun, a weapon that received less favorable comment in Tunisia:

". . .It was found during this operation (Sicily) that whenever the supporting weapons of the battalion were employed properly, excellent results were obtained. Unfortunately in many cases battalion commanders were lax in making the full use of the powerful support which they had in hand. In all training which the Division is now undergoing and which all divisions undergoing training should emphasize, is the importance of the full use of the mortar, both light and heavy, and the heavy machine gun. Plans must also be made for the use of the 57mm and the 37mm gun when the occasion arises. It was found that the 57mm, though employed whenever the occasion arose, was difficult to move because of its method of transport-

ation. The effectiveness of the fire of this weapon is excellent. The 37mm was extremely effective, highly mobile, and produced excellent results. It should be remembered that this weapon when fired at a range of 300 to 400 yards was highly effective against all types of targets, but when employed at longer ranges it had considerable less effect. . ."

14. SCOUTING AND PATROLLING

The prime necessity of well trained, aggressive and resourceful patrols was again emphasized in the Sicilian Campaign, with greater emphasis because of the mountain fighting. The importance of night patrolling was again demonstrated. Because of the rapid enemy withdrawal in some sectors, which resulted in accelerated advances of our troops, motor patrolling in 1/4-ton vehicles likewise assumed importance. The use of long range foot patrols was also useful, as attested by the Commander of the 9th Infantry Division:

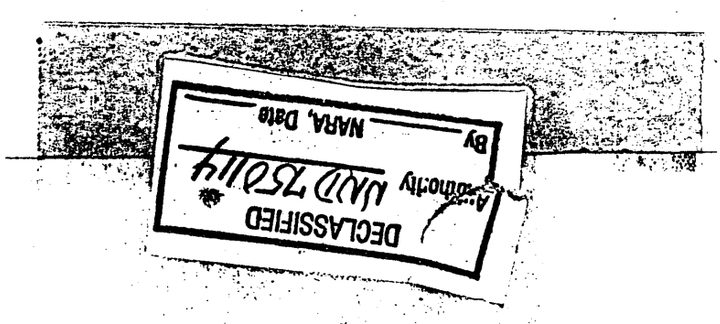
". . .In the advance of large bodies (that is, up to include a regiment) through sparsely defended country but where certain organized centers of resistance are encountered in the advance, both time and lives can be saved by maintaining long range foot reconnaissance ahead of the body of troops. This foot reconnaissance should be executed by small patrols, stripped for rapid movement, and equipped with radios. As long as the advance is not being seriously impeded, the main body can move as a fast column over existing trails and roads, and not be concerned with having to move semi-deployed. . ."

Vigorous patrol action was also brought out in the report of the 1st Infantry Division. The Commander's comments show the effectiveness of trained patrols properly used:

". . .Aggressive patrols were again found essential. . .In one case a 16th Infantry patrol in front of the regimental position dispersed with 50-caliber machine gun fire a German demolition detail in the act of blowing up a bridge. In numerous cases our patrols would go up one side of a hill while the Germans were retreating down the other side. Contact was not lost. . ."

The effectiveness of German patrol action was again noted, and ruses first encountered in Tunisia were present in Sicily. Several tricks employed by the enemy in their night patrols were thus described by a staff officer of the 179th Infantry:

". . .Train your men in the interpretation of night sounds. The Germans are clever in night sound signals in their patrols.



> They use a series of whistles which closely resemble bird sounds or calls--a sort of cheeping whistle of several sorts--and they can fool you very easily if you are not on to them. We were pretty generally fooled by them at first. They actually got close to us and signalled to each other without our knowing it. They also use other sounds for control signals which imitate the short barking of dogs--a sort of yapping bark that's damn realistic. Some of our men thought they were merely dogs from the nearby deserted houses. . ."

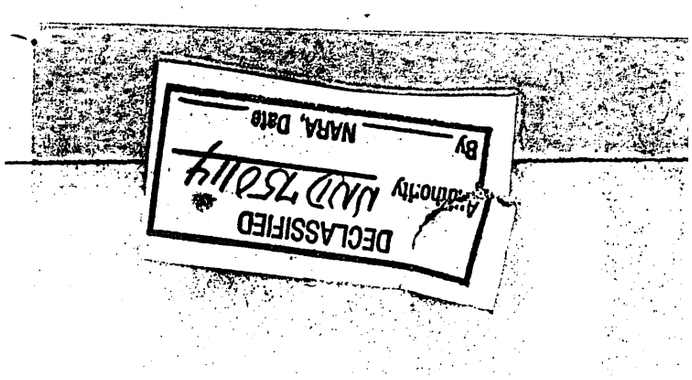
The training and use of foot patrols in the divisional reconnaissance units was recommended by the 9th Infantry Division as a result of experience in Sicily, where operations in vehicles were often not possible because of mountains, demolitions, blown bridges, and destroyed roads. In this connection the Division Commander reported:

> ". . .Reconnaissance troops when given the mission of maintaining contact with the withdrawing enemy must be prepared to follow closely on his heels with foot patrols and the organization of reconnaissance squadrons and reconnaissance troops should be modified to provide foot patrols capable of sustained operations and fighting on foot. The present reconnaissance units are designed to operate and fight from their vehicles. In the Sicilian Campaign, the road net being extremely limited and demolitions and mining being very heavy, reconnaissance units were delayed through being road bound and could not maintain contact with the enemy. . .

15. INFANTRY-TANK COOPERATION

The need for sound training of infantry for combined action with tanks, as distinguished from the action of the armored infantry, was again clearly disclosed in Sicily. The enclosed nature of the terrain precluded mass action of large armored units. Tanks when employed, were usually committed to action in units of less than a battalion in close cooperation with supported infantry. In some instances the terrain permitted the use of a tank battalion in mass. It was noted that new infantry units that had not seen action in Tunisia were poorly trained in cooperation with their supporting tanks, and their commanders strongly recommended realistic and practical training in the combined action of both arms. The need of this training was frankly admitted by a battalion executive of the 180th Infantry:

> ". . .In the U.S. we always trained with what we had, and never had any training in cooperation with tanks. When we



got into action over here in Sicily, and were given tanks to assist and support us, we actually didn't know how to use them or work with them. There must be real training for the infantry with actual tanks in realistic combat exercises. . .We could have done much better in several places over here if we have been given training in this before going into action. Only twice did we get real benefit or advantage in the use of attached tanks, and this wasn't the armored people's fault. We were just too unfamiliar with the proper way to use them. . ."

Similar testimony has been given by a staff officer of the 179th Infantry, who reported:

". . .At GRANIERI we just didn't know how to work with the attached tank unit. When our tanks came up to support us after we had broken up the German attack, we did not follow up the tanks properly as they went forward. Had we done so we could have cleaned out almost a battalion of Germans. We had not been trained to work with tanks, and we remained in position after they went forward. If we had known how to go forward with them, we could have done a much better job and could have gotten all the Germans' vehicles and materiel. . ."

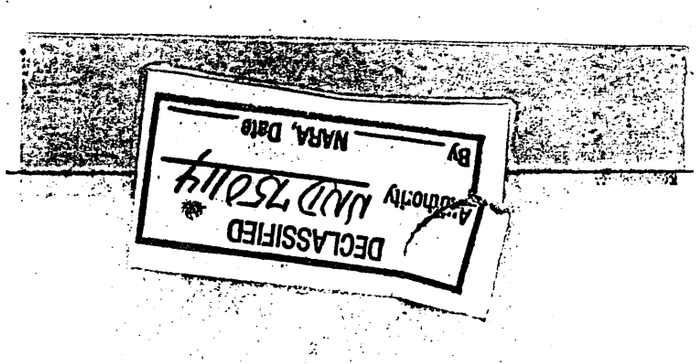
In the case of units that had seen considerable action in Tunisia, where infantry and tanks had been used in combined action, the results in Sicily were more favorable. In the 1st Infantry Division, a high degree of success was attained. The Commander of this division summarized his experience as follows:

". . .During the major portion of the Sicilian Campaign, one battalion of light tanks and one company of medium tanks were attached to this Division. Due to the mountainous type of terrain the tanks were nearly always canalized. However it was found that in certain areas tanks could be used to advantage in assisting the infantry in gaining ground by lightning thrusts by tanks followed closely by the infantry assault. Tanks were always used <u>en masse</u> with all their supporting weapons, and whenever an attack was made the objective was taken. The enemy never knew when to expect a tank attack, and as a result many antitank guns that were put up close to destroy our tanks were overrun by infantry when actually no tank attack was contemplated. . .Light tanks were also used for reconnaissance by the 91st Reconnaissance Squadron with excellent results. They forced the enemy to spread his defenses over a wide area and thus weakened any one portion of his line. . .

The light tank battalion was also instrumental in clearing enemy strong points, enemy artillery, and personnel. The battalion with a platoon of medium tanks was used to make a sudden attack down the valley east of GANGI and withdrew. This attack accelerated the enemy withdrawal to SPERLINGA and NICOSIA. . ."

16. <u>NIGHT ATTACKS</u>

The value and effectiveness of night attack were proved



in many phases of the campaign. Their success was largely due to sound previous training in night operations, to careful preparation and planning, and thorough reconnaissance before such attacks were launched. Commanders have stated that the most serious difficulty in such operations has been reorganization in darkness after the attack. The Army Commander reported as follows on the subject:

> ". . .There is considerable feeling in favor of night attacks. When these are used. . .they should be executed by taking advantage of the moon, or they whould be put on 2½ hours before dawn if there is no moon, in either case on a limited objective. The heavy weapons and artillery should be put into position and registered the night before. They can then cover the attack until the flashes of the leading infantry show they are coming close to the objective.
>
> . . .A night attack whether executed by moonlight or just prior to dawn must be confined to limited objectives, and these objectives must be carefully reconnoitered the previous day, and the men who made the reconnaissance must lead the units to the objectives. In making this reconnaissance it is sometimes necessary for patrols to expose themselves in order to draw fire.
>
> . . .Night attacks against unreconnoitered positions, particularly in hilly country, are very apt to fail because viewed against the stars or moonlight, one hill looks like another and troops misjudge their locality by as much as a thousand yards. . ."

The experience of the 45th Infantry Division in night attack was particularly successful, and has been summarized by the Division Commander in his report of the Campaign:

> ". . .This Division employed night attacks to the fullest extent possible. They were universally successful. It was found that whenever the enemy could be kept on the move continually, they were unable to execute demolitions to the fullest extent and emplace mines. It is believed that whenever the enemy employs inferior forces in delaying action a continuous pressure must be exerted. Without question the employment of successive night attacks reduced the casualties of this Division to a considerable extent. In many cases the Axis forces had very well prepared positions which if attacked during daytime would have caused considerable delay. It is recommended that troops be trained to operate at night at least 50% of the time, and this method of warfare will obtain dividends commensurate with the effort expended. . ."

17. VOLUME AND DISTRIBUTION OF INFANTRY FIRE

The Campaign disclosed that the necessity of building up a sustained volume of infantry fire properly distributed was not

fully understood and executed. This deficiency was clearly pointed out in the Army Commander's report:

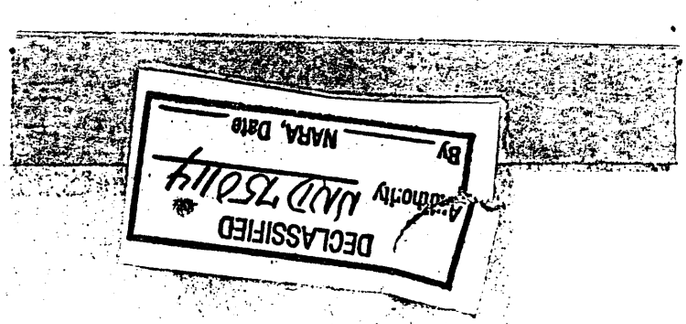
> ". . .It is the general concensus of opinion of all officers who have actually participated in battle that our men do not shoot enough. This is because we have for years been taught not to shoot unless the target was seen and was a profitable one. This is a mistake, and it is highly desirable that controlled but continous fire be directed on any infested locality from which enemy fire is emanating whether or not the individual doing the shooting can be actually seen. This statement applies to all types of fire available to the infantry regiment.
>
> . . .Fire reduces fire, that is, firing on the enemy reduces his ability to fire on you. If men halt and lie down without firing, they are immediately subjected to intense fire; whereas, if they keep moving forward or if they open fire on the enemy or on the locality from which he is firing, his fire is immediately reduced. This point must be emphasized in training and in battle—too much stress cannot be put on it.
>
> . . .Intimately connected with the foregoing is the question of fire distribution. Our men have a tendency to shoot at obvious portions of a target rather than to fire straight to the front at less visible targets. This results in those portions of the enemy who are visible receiving all the fire while our men receive the undisturbed fire of those portions of the enemy who are not so clearly visible. . ."

This deficiency in the fire training of our troops was also stressed by a battalion commander of the 30th Infantry, in connection with the basic principle of fire and movement:

> ". . .At times our troops did not make use of the proper volume of fire to cover the movement of other elements to the flanks or forward. In only one instance, in the battle at SAN FRATELLO, did I see proper volume of fire built up to cover the movement of maneuvering troops against the enemy. The troops seem to understand the principle of fire and movement, but they failed to grasp the fact that fire means a volume of fire. Too often there is a tendency of the men to engage in individual sniper duels instead of pinning the enemy down with a mass of fire. . ."

18. INFANTRY ADVANCE UNDER ARTILLERY FIRE.

The lesson experienced in Tunisia, that advancing infantry who come under hostile artillery fire must continue to go forward and not take cover in place, was again driven home in Sicily. This point was given emphasis in the report of the Commander of the 9th Infantry Division:



". . .Infantry should be taught and convinced that they must keep advancing under light artillery fire, and it should be hammered into them that if they keep advancing in a dispersed formation they will take less casualties than if they halt and give the enemy artillery a fixed target on which to adjust and concentrate. . ."

An example of the soundness of this principle was also given by a battalion executive of the 180th Infantry:

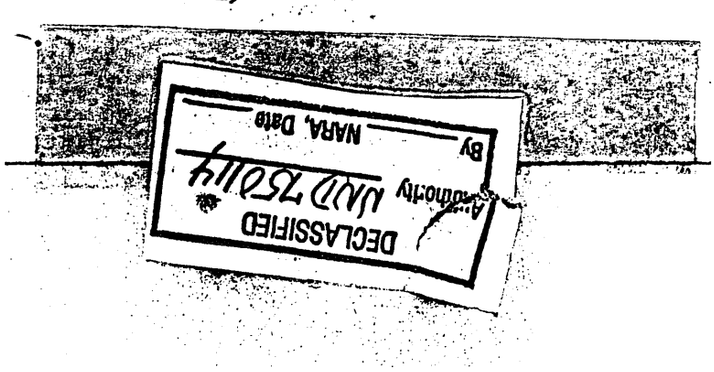
". . .Men must learn to move properly when hostile artillery fire falls on them. Often the areas we moved into had recently been abandoned by the Germans. They must have had their ranges plotted to a tee, for they rained artillery on us . . .when we moved through their abandoned positions. When this fire came down, we learned to go forward to get out of it. . .At CASTELBIBUNO we had just moved into an area and a sudden and severe artillery concentration came down on us. We immediately moved forward. . .Just about the time we were moving out, a round came in and burst about a hundred yards to the front of us, followed by one about a hundred yards in rear. It was a perfect bracket. We moved forward at the double, and escaped the concentration that plastered the area we had been in. With us had been an artillery wire truck and line crew, and instead of going with us, they took cover under what shelter they could find. The barrage came down and wiped them out, truck and all. . ."

19. COMMUNICATIONS

a. One of the chief lessons from Sicily was the high degree of success in the use of radio relay in mountainous country. Radio stations were frequently set up on successive ridges and messages were relayed to wireheads. Wire was extended to relieve the rear stations, which leap-frogged their radios forward to further extend the radio relay. This system solved many problems of communication in difficult, mountainous terrain.

b. The need for a trained specialist in radio maintenance and repair was again felt in each battalion. Use of radio in mountain country increased the need of maintenance, repair, and adjustment, largely because of improvised methods of transportation, carrying and operation in rough country.

c. Sound training in line maintenance and trouble shooting is vital to infantry wire communications, especially in mountain fighting, where much used trails, tracks, and roads are often the only places where lines can be laid.



d. The organization of runners at intervals of approximately a mile to carry messages by relay often proved highly valuable for fast foot transmission of information when wire and radio were not available.

e. On shorter lines, the use of ground return for telephone communication often worked better than the complete wire circuit. The use of this method required careful pre-arrangement between stations.

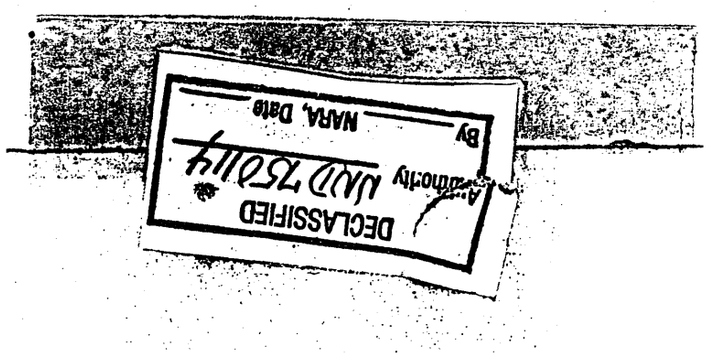
f. Field telegraph should not be neglected. In Sicily it was often found to work better on long lines than did telephone communication. Often slight grounding or other interference prevented effective voice transmission, but did not affect key transmission.

g. Full advantage should be taken of every lull in operations to repair and overhaul signal equipment. In action, especially in mountains, signal equipment becomes damaged and in need of repair and maintenance. Communications officers must be alert to every opportunity and possibly for repair, maintenance, and overhaul.

20. EMPLOYMENT OF THE 4.2 CHEMICAL MORTAR

An outstanding lesson-experience was the performance of the 4.2 chemical mortar as a supporting infantry weapon. White phosphorus and HE used with this mortar proved to be effective beyond expectations, and comment not only from the supported infantry but also from German prisoners attested the extraordinary power and value of this weapon. Its accuracy, fire power, and devastating effect on many types of targets proved invaluable. The transportation and ammunition problems were fairly well solved by the use of the 1/4-ton truck for a prime mover and for transport of ammunition. It was found that the 1/4-ton could also be satisfactorily used to tow the organic chemical trailer, and in some instances, trailers were thus hauled in tandem.

The Army Commander made special comment on these weapons in his report at the close of the Campaign:



". . .The 4.2 mortar firing white phosphorus or high explosive shell is a terrifically destructive weapon, but its present mount is almost wholly immobile and it can be used only in the first phase of an attack. If it could be provided with a tractor-drawn mount from which it could fire it would be tremendously valuable. . ."

The Army Chemical Officer also testified to the effectiveness of this mortar, and stated that each chemical unit "distinguished itself on every occasion that its weapons were employed correctly, and each proved the devastating effect of white phosphorus as an anti-personnel weapon." This judgment was strongly confirmed by various battalion commanders whose units were supported by chemical troops, several of whom recommended inclusion of the 4.2 in the organic equipment of the infantry heavy weapons company. The commander of the 45th Infantry Division reported the following generalized experience:

". . .This weapon was used throughout the entire campaign. The 2nd Chemical Battalion was attached to the Division. The Division in turn attached one company to each combat team. While this mortar with its means of transportation was difficult to move, it was found that it could be kept up with the troops by personnel of its companies, and as a reinforcing weapon it produced excellent results. It is believed in most operations, especially in rough country, that the chemical battalion should be attached to the infantry division as reinforcing troops. In fact, an organization such as this would prove of considerable value to an infantry division in almost any type of combat. . ."

21. CAMOUFLAGE AND CAMOUFLAGE DISCIPLINE

The Campaign revealed the need of more thorough training of the rank and file in camouflage and camouflage discipline. Most unit commanders felt that it was a case of educating the men more fully in the importance and necessity of good camouflage and training them to the point where proper camouflage measures become automatic and second nature. Reports and testimony showed that men must be taught to take pains, to make their camouflage thorough, and not to be satisfied with mediocre or only partly completed work. "Effective camouflage cannot be achieved in a hurry. It is hard work, and it is often tedious," was the judgment of one battalion executive in the 45th Infantry Division. The Major General personally representing the Commander-in-Chief in the battle area stated:

". . .Camouflage is still not the best that can be obtained. The outlines of objects are in many cases not broken by the nets. Men can often be seen from the air in white undershirts or stripped to the waist standing in the open and gazing up at the plane. . ."

22. ENVELOPING TACTICS

The successful and rapid advance of our forces was largely possible because of continual use of enveloping tactics well executed throughout. Frontal attack was avoided. The basic principle of fire and movement was adhered to, with emphasis on envelopment from the flanks. An excellent example of the success of these tactics was reported by the Commanding General of the 1st Infantry Division:

". . .The double envelopment of the German positions in the valley just east of GANGI was executed by sending the 18th Infantry deep to the north of the main road to strike east and south behind the enemy resistance, the 16th Infantry to the south of the road to strike east and north behind the enemy position, while the 26th Infantry which held positions in the center prepared to make a frontal attack. The 70th Tank Battalion (Light) made a speedy and limited objective attack east on the main road and withdrew after disorganizing the enemy and destroying at least one 77mm gun. This envelopment speeded the subsequent capture of NICOSIA.

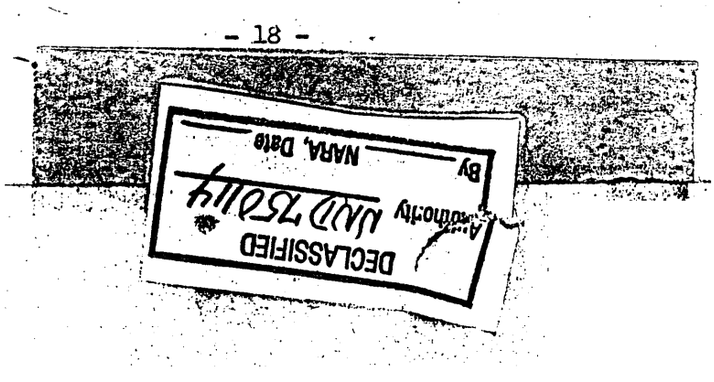
A generalization of the subject was made by the Commander-in-Chief's personal representative in the combat area, who summarized the campaign as one "of maneuver under cover of fire," and stated:

". . .A study of this campaign will show, I am sure, that there was not one single frontal attack launched by a large unit. This was made possible by our superiority of fire power and air support which allowed troops to maneuver around the flanks of the enemy. I believe that the attack on TROINA was the toughest battle Americans have fought since World War I, and there were very few in that war which were its equal. The losses which we would have suffered in this battle had we made a frontal attack against this highly organized position would have been enormous. . .

. . .The men of the Seventh Army marched tremendous distances over the roughest terrain I have ever seen. . . .Incredible marches have been made, and these have allowed attacks to be launched from directions that would give the maximum of success with the minimum loss of life. . ."

23. DEALING WITH ENEMY COUNTERATTACK

Enemy offensive action was confined to sharp local counter-



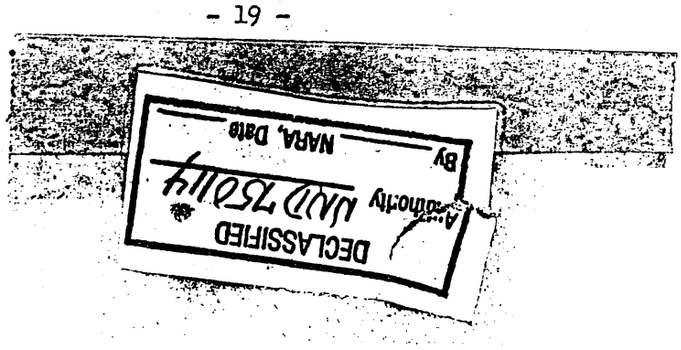
attacks which were part of his general scheme of defensive and delaying action. Although these attacks were local, they were often determined and vigorous. American experience in this aspect of the campaign has thus been summarized by the Army Commander:

> ". . .The German will invariably counterattack immediately after dawn and is very adept at supporting this with artillery and mortar fire. After he believes the position has been softened by supporting fire, he advances on it from the front with a small number of infantry and seeks to envelop one or both flanks with the majority of his infantry. This infantry starts to attack between 800 and 1000 yards and comes forward at a continuous fast walk using marching fire or firing from the halt or from the kneel.
>
> . . .In no case where our infantry untilized the full power of their rifles did an attack get home. In fact our troops looked forward to the German counterattack as the surest and most effective way of killing Germans. Nevertheless, the certainty of receiving such an attack makes it very evident that the position gained at night must be ready for an attack by daylight. . ."

24. USE OF SNIPERS AND DEALING WITH ENEMY SNIPERS

Snipers were freely used by both Allied and Axis forces. The terrain and the nature of the campaign made effective sniping a valuable asset to all infantry units. Commanders recommended a higher degree of sniper training for units not yet in action, and pointed out that the capable sniper must be more than a crack marksman with a special rifle. The elements of patience, study of enemy habits, and ability to operate and move with almost perfect concealment were all stressed. Frequent change of position after firing was also a point that was emphasized.

Enemy snipers firing from concealed delaying positions and from mountains were a major nuisance. Units learned to deal with them in a number of ways, the most effective of which was the use of specially trained squads of "sniper killers". These groups would locate the hostile snipers, and part would engage the sniper's attention and fire while the remainder would work around to the flanks and eliminate him. German snipers in civilian clothes were especially annoying in Sicily, since our troops had strict orders not to molest civilians. In the passage of



towns, it became difficult to distinguish local civilians from German snipers in disguise.

25. USE OF ANTITANK RIFLE GRENADES AND BAZOOKAS

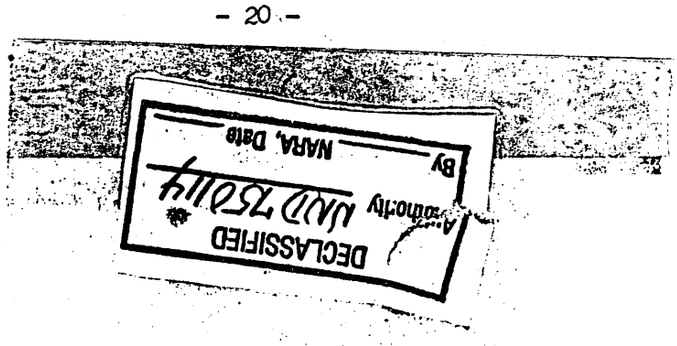
Both of these weapons proved to be effective. Some units preferred the grenade to the bazooka, and vice-versa, but the general opinion was that in the hands of determined and well trained men, both can be capable of dealing with enemy armored vehicles at short range. The Army Commander has recorded that "on four specific occasions the bazooka has accounted for Mark IV tanks," and an officer of the 179th infantry reported two tanks of similar metal that were knocked out and burned by rifle grenades alone. The Commander of the 180th Infantry also recorded an armored self-propelled gun wrecked and its crew killed by a bazooka crew firing at 30 yards, and further reported that his men had successfully driven off a Mark VI tank with grenades.

26. PILLBOX REDUCTION AND NEUTRALIZATION

Pillboxes were encountered all over the Island. They were generally sited to cover roads, approaches, valleys, and stream crossings. In some instances the siting was poor and they could be easily by-passed. In others, they were well placed and provided the enemy with excellent fields of fire. The latter were dealt with by massed fire of mortars of all calibers, light antitank guns, and heavy machine guns. In some cases it was necessary to use bangalore torpedoes when fire could not be brought to bear in sufficient volume.

Concrete was the usual medium of construction. Three general types were found, from a circular form with walls 18 inches thick with a 2-foot roof, to the largest type which consisted of a circular wall 14 feet across, 4 feet high, surmounted by a domed roof 9½ feet high externally. The wall was 5 feet thick with roof tapering to 3½ feet thick at the peak of the dome.

Camouflage of pillboxes was extensively employed. Many were covered with brush, straw, hay, and other natural media. Others had



houses built over them to represent buildings or huts. Many were covered over with native cane to resemble thatched outbuildings. In open grain and pasture land a number were found completely camouflaged as straw and hayricks.

Pillboxes camouflaged with such inflammable materials as those described in the preceding paragraph were easily disposed of by mortars using white phosphorus. As stated by the Commander of the 30th Infantry, the enemy in his efforts to camouflage these pillboxes often "dug his own grave. . .

> When we learned to recognize them for what they were, we dosed them freely with white phosphorus, especially from the attached chemical mortars, and this did the work to perfection. We set the camouflage on fire, blinded the gunners inside, and choked them with the phosphorus and smoke from the burning straw, hay, and other material. The fire and heat, too, made the interiors untenable, and the occupants would become terrified and come out in a bunch and surrender.
>
> In one place near LICATA there were several of these straw and hay covered pillboxes and some concealed with cane huts situated at key positions in country covered with wheat fields and terrace grain plantings. We simply set a first-class prairie fire with white phosphorus and burned out a position 2500 yards long and every pillbox in it. We waited until the wind was just right, and then let them have it. . ."

27. PROVISION FOR FRESH RESERVES

Experience in the Sicilian fighting showed that after three days under fire infantry front line troops pass the peak of their efficiency. Unit commanders under similar conditions should keep this fact in mind and hold out a fresh reserve at all times. This reserve should be rotated and kept in positions as protected as possible in keeping with the tactical situation.

The excessive fatigue by rapid marching and fighting over successive ranges of mountains led one division to relieve the troops engaged by the process of "leap-frogging" combat teams. This was twice successfully done during the drive to the north and in the advance on PETRALIA.

28. NIGHT OPERATIONS IN GENERAL

The level of night operations in Sicily was greatly improved over those in Tunisia. There was demonstrated, however, the need for continued improvement. This can be achieved only by additional emphasis in training. The importance and need of such training was concurred in by all the unit commanders with whom the subject has been discussed, and the Commander-in-Chief's representative in the field has reported that "we are still not as good as we should be in night operations—more training is necessary." The Army Commander likewise stated in his report that:

> ". . .Night combat has such an important place in war and is so disliked by the Germans that we should specialize in it. Great improvement in night operations, particularly with regard to eyesight, is produced by practice. . ."

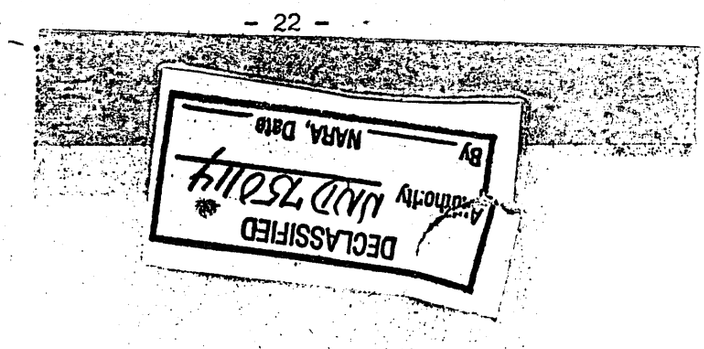
29. INFANTRY OFFICER TRAINING IN ARTILLERY FIRE ADJUSTMENT

Experience in Sicily again brought out the advantage and value of training in artillery fire adjustment with forward observation methods for infantry officers. The technique is simple and easily learned, and on several occasions when artillery forward observers were wounded or were not available at the moment, excellent results were obtained by infantry officers calling for fire and handling the adjustment by forward observation methods. One battalion commander in the 180th Infantry has recommended that instruction in this be made part of regular infantry officer training.

30. MISCELLANEOUS

a. Map reading, for both officers and enlisted men, should be stressed in training. Individuals should be given special instruction in foreign maps before entering an overseas theater.

b. Troops should be trained not to dig slit trenches under and at the bases of large trees. Tree bursts from hostile shell fire have caused a number of casualties among troops occupying such places. Tree bursts overhead give the effect of time fire, and the slit trench does not afford protection from splinter. In one company this lesson cost seven casualties.



c. Greater proficiency in the use of the compass should be attained among infantrymen. In strange, new country, and especially at night, the compass is the soldier's only means of location and guidance. Its use should become second nature.

d. Training is needed in locating enemy weapons from their fire. In some cases men under machine gun fire had difficulty in telling from what direction the fire was coming. Several commanders recommend training in "crack and thump" methods in connection with battle innoculation.

e. Field and combat firing should be given more emphasis as compared with known-distance range firing, especially for automatic weapons.

f. There is still a definite need for more realism and battle innoculation in the training of new units that have not yet entered combat.

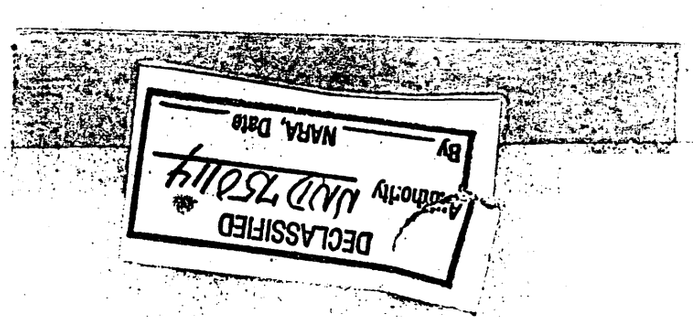
g. The importance and value of well-trained company runners was disclosed throughout the campaign. Only men of a high level of intelligence, with superior stamina, and capable as scouts withstood the strain that continuous operations in the mountains imposed on runners.

h. From the highest units down there was a lack of understanding of the value of reconnaissance and how to execute it. All infantry rifle soldiers must be taught how to scrutinize country for concealed or camouflaged gun emplacements and pillboxes.

i. All men should have some knowledge of the enemy order of battle, and some basic elementary training in his tactical doctrines and habits. It is possible to teach men to recognize the nature of the force opposing them. This will greatly increase their confidence.

j. The infantry of the divisions learned not to be road-bound. Their units fought from hill to hill, and across country.

k. Infantry commanders should keep local reserves close enough to forward elements that they may affect the action. There



was failure to do so on several occasions, and a tendency prevailed to send unsupported small elements forward of the main body to probe out enemy positions. Invariably the intention of attack was given away before the main body could get to the objective, and the small initial force would be driven off and the enemy would then prepare to meet a much larger force.

SECTION IV : FIELD ARTILLERY UNITS

31. GENERAL

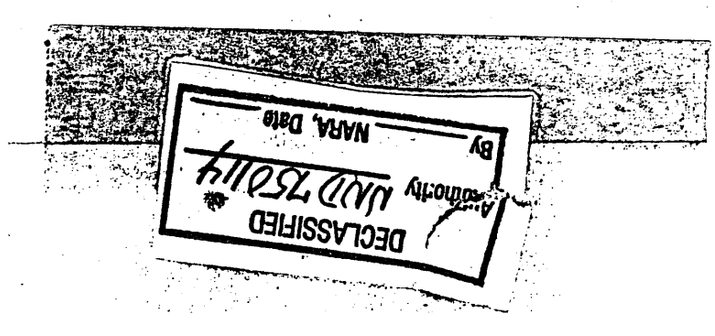
a. The operations of the field artillery in Sicily were marked by a high degree of success. Experience in the Campaign clearly demonstrated that well trained units can maintain effective and continual support despite the difficulties imposed by mountainous terrain, scarcity of good position areas, limited and congested roads, and an unusually rapid rate of advance. Fitting tribute to the work of the artillery was paid by the infantry commanders. A battalion commander of the 157th Infantry warmly stated that the artillery of his combat team was:

> ". . .never out of support for more than five minutes throughout the whole campaign. Their support and cooperation was grand. They keep right up on our heels all the time, and that is just what we have got to have. They leap-frogged their batteries continually and went into some of the worst positions I have ever seen and delivered the goods. They were always right there when you needed them. . ."

Further unsolicited comment was made by an infantry battalion executive who declared that

> ". . .Our artillery support was magnificent. They did the best job I have ever seen. Our cooperation with them and theirs with us was 100%. This was true all over the Division. The batteries went into the worst positions you have ever seen and gave us wonderful support. . ."

Likewise the Commander of the 45th Infantry Division reported at the close of the campaign that "at no time during the entire campaign was the infantry of this division without artillery support."



b. Allied air superiority as a factor influencing the success of the artillery, especially with respect to continual movement over few and vulnerable roads, should not be overlooked. A division artillery S-3 drew attention to this fact in the statement that "almost total lack of effective enemy air activity materially influenced what we did, or could do, with impunity."

c. The basic principles and doctrines of the Field Artillery School were again proven sound. Much of the success achieved was the result of applying them with judgment, flexibility, and with due regard for the existing situation. A division artillery executive reported informally that

> ". . .Our experience (in Sicily) has satisfied us fully that American field artillery doctrine is correct. We have had to make some modifications because of unusual terrain and the speed of the campaign, but these were only common sense. Basically, the books are right and have been proven right. Judgment is necessary in the application of any fundamental principle, and this true of our artillery doctrine. But this proves rather than weakens the soundness of our principles. . ."

Statements idential in nature were made by a number of battalion commanders in informal reports and discussion.

d. The effectiveness of the artillery fire throughout the campaign was outstanding. It was equally efficient for inflicting large numbers of casualties and for destroying enemy morale and his will to fight. The employment of artillery in mass, the accurate delivery of concentrated volumes of fire, and timely, satisfactory adjustment by forward observers all contributed to the results attained. The use of white phosphorus and time fire with high explosive shell were also powerful contributing factors. Testimony of the effect of the artillery appears in statements and reports of the supported infantry, German prisoners, and in captured enemy documents. The Commanding General, 1st Infantry Division reported:

> ". . .The Germans in Sicily have experienced artillery concentrations which they had seldom seen before. The 1st Division in the last stages of this campaign had approximately

twelve battalions of artillery in support, and consequently it was possible to support individual companies in an attack. The Germans, realizing our superiority, would engage only at night, but unlike the German guns, our artillery was continually harassing the enemy all through the night and caused much damage and heavy casualties. In the brief but sharp counterattacks the Germans attempted, they were actually slaughtered before physical contact was made with our troops. . ."

Significant comment was made by an infantry battalion commander who reported an incident from combat experience of his unit:

". . .In one place where we just couldn't get forward because the Heinies were on superior ground and had us pinned down with rifle and machine gun fire, the division artillery massed nine battalions on them and plastered them with 1500 rounds in less than 30 minutes. We then walked through that position without a scratch, and the German dead were all over the place. . ."

Similar experience illustrating the effect of fire on armored vehicles was recorded by an infantry battalion executive officer:

". . .About six kilometers north of BISCARIA we were caught in a position by 18 tanks and halftracks. We were really in a spot and were low in heavy ammunition. We had left only about seven rounds of mortar bombs, six bazooka rockets, and about seven or eight AT grenades. Those enemy armored vehicles really had us in a bad way. Our artillery liaison officer. . .called for fire. . .and gave the map coordinates of the tanks. He called for one air burst to get adjustment, and the round came down right over the tanks. He then called for fire for effect, and the artillery really laid it on them. I don't know how many batteries they massed, but the fire was magnificent. It destroyed several tanks and the rest were driven off. . ."

Even when the massed artillery fire did not succeed in producing casualties in large numbers, it served to neutralize the enemy infantry and drive them underground. In this connection the Commander of the 1st Infantry Division has reported that

". . .The Germans were able to avoid many casualties from artillery by digging deeper than the average American soldier is willing to do. Captured prisoners stated that their officers forced them to dig 'another two feet' when they thought they had dug enough. In some cases they dug down and cut under to prevent casualties from air bursts. With the tremendous concentrations of artillery that the 1st Division laid down on the German forces, the reports were that the sound of the fire was demoralizing, but that there were not many casualties when the men were in foxholes. . ."

Testimony from the receiving end of our artillery fire appears in a letter from a German artillery soldier to his family. The letter was captured in the German positions at TROINA on August 7:

". . .Right after we had left our position such a terrific barrage started that an infantry sergeant while being pinned to the ground said that he had never experienced anything like it in France, Poland, or Russia. There were many dead, and myself and two more comrades were right in the midst of it. It is impossible to describe it. One grasps the earth with his hands, presses his face to the ground and waits for. . .the direct hit or fragments which will take one's young life. . .

. . .Without scruple, hit after hit comes five metres in front, ten behind, sideways, all over. . .Next day brought us to a new position. Here in this miserable hell enemy aerial reconnaissance discovered us. This brought artillery barrages and abandoning had to be made in the evening. . .

. . .This Sunday brought us into a new position. Again the enemy artillery cover us. You have no idea how it feels to have the shells whizz over your head. . .all night long.

. . .Last night we moved out without having been shot at. Even on the way we did not encounter the so-called "magic fire." This was rare. Incidentally, "magic fire" (Feuerzauber) is the nickname for the mad artillery barrages which the enemy shoots over to us. At midnight we arrived at our new position. . .So, even there the 'magic fire' caught up with us.

. . .The last two days brought always the same. Artillery fire on a moving band. The artillery fires on our road for retreat with the heaviest caliber guns. . ." **

** Translation by G-2 Section, II Corps.

32. MAJOR LESSONS IN SUMMARY

a. Artillery operations in mountainous terrain such as was encountered throughout Sicily produced several general lesson-experiences common to all units. These lessons are summarized here, in addition to specific subjects which are treated in more detail below.

b. Outstanding was the necessity for the greatest degree of resourcefulness, determination, teamwork, and perseverence in the occupation of positions in terrain presenting extreme difficulty. The speed of the advance through the rugged country necessitated continual displacement, and the problems of locating and occupying positions were especially great. Continual, 24-hour reconnaissance for routes and areas, determination to continue effective support and refusal to admit that positions were "impossible", even to the point of winching in the guns and blasting out positions with demolition charges--these were among the major lessons of the artillery with respect to mountain operations over poor and limited roads.

c. The effect of mountain terrain on a rapidly advancing campaign brought out the necessity for firing at extreme ranges, as well as the need for a longer-burning time fuze for shell to permit effective time fire at such ranges, especially for counterbattery fire.

d. The terrain also presented major difficulties with respect to communications. These were effectively overcome by the use of radio relay, which required planning, resourcefulness, and a high level of coordination on the part of communications personnel. The results of radio relay were highly satisfactory.

e. Artillery experience in Sicily re-emphasized that in mountain combat, forward observation is the primary means of directing fire. Over 90% of all observed fires delivered by the units engaged were conducted by this method.

f. Outstanding was the successful operation of the air OP aircraft, despite difficult terrain and the scarcity and poor condition of available landing fields. Pooling of aircraft and observers under division control was found to be a satisfactory solution to the lack of airfields.

g. Artillery in pursuit action such as was conducted in Sicily brought out the fact that support missions of the batteries must be accomplished regardless of how seemingly "impossible" some of the local situations were, or how difficult were the obstacles in the way of occupation of position and delivery of fire. The old lesson of pressing the batteries forward was again re-emphasized to almost an exaggerated degree because of the constantly moving situation. In pursuit of a steadily withdrawing enemy, batteries at times occupied positions within the infantry area, and in some special situations it was necessary to place all the artillery of a division in position ahead of the infantry in order to reach enemy forces which were trying to withdraw out of range.

h. The importance of continual harassing fire all day and all night--a persistent 'round the clock' shelling--was clearly demonstrated. The use of roving guns proved to be especially effective for this purpose,

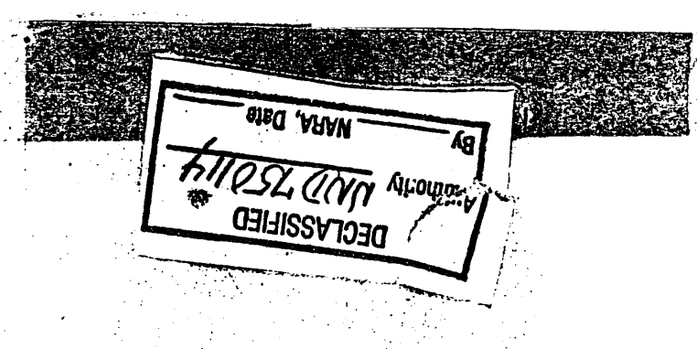
particularly those of the reinforcing self-propelled batteries.

33. TACTICAL EMPLOYMENT

a. Standard tactical employment was followed throughout. The experience of the Tunisian Campaign with regard to close cooperation between the organic divisional units and the attached reinforcing artillery was again repeated in Sicily.

b. Because of the peculiarities of the campaign resulting from terrain conditions, restricted road nets, and rapid pursuit action, there were a number of instances when it became necessary to intermix corps and attached battalions with units of the organic division artillery. Also because of terrain and movement, reinforcing units at times were employed in advance of organic direct support battalions in order to reach with their fire special targets or enemy forces withdrawing beyond the reach of the organic units at hand. In these instances the more normal practice of displacing the organic units with the general advance with the general support battalions following in order was reversed because of the special requirements of the moment.

c. The lesson of employing artillery in mass involving a large quantity of general support and reinforcing units was again repeated in Sicily. In addition to the organic division artillery, the American forces employed a total of 12 general support and reinforcing battalions, which included 6 battalions of 155mm howitzers, 2 battalions of 155mm guns, 3 battalions of 105mm self-propelled howitzers M-7, and 1 observation battalion (flash and sound ranging). The fire power of this reinforcing artillery was further strengthened by the six-gun organization of the 105mm self-propelled batteries. After the Provisional Corps of Seventh Army had overrun the western end of the island, all the attached artillery which had supported it was released and assigned to II Corps for the advance on the MESSINA bridgehead. In this operation the II Corps employed an overwhelming mass of light and medium pieces which provided



a concentration reported by the Seventh Army Artillery Officer as "an outstanding feature in the taking of the strong enemy position at TROINA."

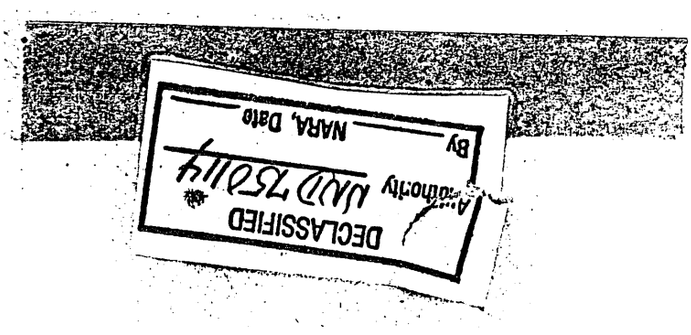
d. Although rendered necessary by the existing situations encountered, the employment of units of the Corps artillery brigade as attached battalions should be avoided whenever possible. The Corps artillery brigade has the responsibility for general support within the corps sector, and this responsibility cannot be best fulfilled if its units are attached to divisions and are lost to the control of the Corps Brigade Commander. This principle was specially mentioned in the report of the Commanding General, 13th Field Artillery Brigade in his report on the campaign:

> ". . .The need of attached artillery to supplement organic divisional artillery has been demonstrated in this and in past campaigns. Armored artillery battalions were attached to divisions and proved invaluable in the moving battles along rough Sicilian roads. However, it is believed that such artillery should be taken from a pool of separate artillery units established for the purpose. . .They (Corps Artillery) should not be expected to perform the dual role of direct and general support. . ."

The Seventh Army Artillery officer concurred in this general principle as a result of campaign experience and concluded in his report:

> ". . .It is again emphasized that integrity of Field Artillery units must be maintained in order to secure the most effective support. When decentralization is necessary, units should revert to centralized control at the earliest possible time. . ."

e. A major portion of the Corps Observation Battalion was employed in decentralized flash and sound ranging detachments which were attached to divisions. Although satisfactory results were generally obtained, both the Brigade and battalion commanders have recommended against decentralizing the battalion into divisional detachments. Their concurring recommendations call for vesting the responsibility for flash and sound ranging operations within the corps sector in the Brigade commander who in turn delegates it to the commander of the Observation Battalion. One primary reason for this recommendation was that the entire personnel of the battalion is composed of technical specialists with specific technical jobs to perform, and when the battalion is broken down into divisional detachments, there are not sufficient men to complete the technical organization and operations in the



several separate detachments. The 13th Field Artillery Brigade Commander also reported that,

> ". . .The general unfamiliarity with the technical employment of flash and sound ranging units led to the misuse of the divisional detachments of the Observation Battalion. It was found more satisfactory to assign the Observation Battalion commander the mission of supporting the Division, thereby taking advantage of his knowledge and experience in the formation and employment of a suitable detachment. . ."

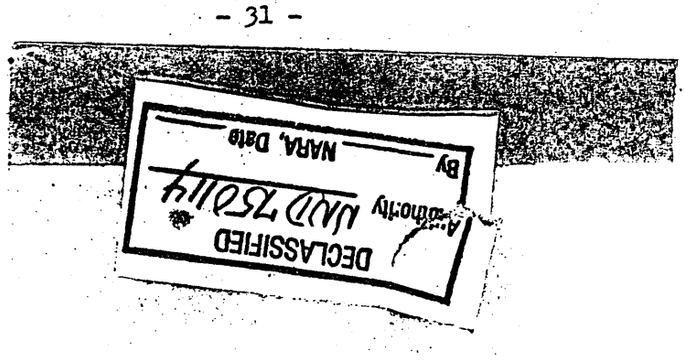
Detachments of the Observation Battalion were also used to advantage for supplying division artillery survey sections with data for survey by the "sun shot" method. This work was done in addition to their primary mission of locating hostile batteries.

34. OPERATIONAL TECHNIQUE

a. Occupation of Position

The rugged mountainous terrain afforded few position areas that did not involve difficulty, severe manhandling of pieces, and even winching pieces into position. Some units learned to support their infantry from positions that their commanders described as "unhead of" or would have considered impossible in normal maneuvers and training exercises. In one unit it was necessary to use demolition charges to blast out positions for individual pieces when an area from which support had to be given could not be occupied in any other way. As a result of experience in Sicily, many battalion commanders strongly recommend the training of units in the occupation of the worst possible ground in their exercises and maneuvers, in order to prepare them for the problems that will arise in combat, particularly in mountainous country. A summary of this experience was given by the S-3 of the 45th Division Artillery:

> ". . .Despite the terrain and road conditions, the artillery of this Division has always been able to keep right up with the infantry, even when the pursuit was going at top speed. Some of the positions we used, however, really tried the ingenuity of the batteries and showed what resourcefulness and determination could do. We have had to put guns in places where only a billy-goat could have gotten his hoofs. Often the batteries had to winch their guns in with the truck winches, and more than half of the positions we had



would have been considered impossible in the U.S. training period of the Division. . .Yet our men got their guns in and delivered the fire where it was needed. . ."

Similarly the lesson of providing the necessary support despite existing difficulties however formidible was emphasized by a light battalion executive:

". . .The necessity of being able to get into the most seemingly impossible positions was clearly demonstrated. Often enough it appeared that positions could not be found in an area, but when it was a case of no supporting fire because of the terrain, we always found the positions and got the guns in somehow. Manhandled them, winched them in, any way at all, so we could get the fire out where it was needed. The more training a battalion can get in occupying positions in difficult terrain the better it will be. Such training will not only get the batteries used to bad situations, but it will also develop the much needed cooperation and teamwork of everybody--drivers, cannoneers, all the men--in getting the job done. . ."

b. Organization of Position

The terrain generally precluded any real choice in the organization of battery positions, and on the whole units employed no set standard shape or formation with respect to the location of pieces. The main considerations were locating pieces where they could deliver maximum support, maintain proper dispersion, and have provision for rapid displacement. Most battalion commanders stated that their chief concern was getting their batteries into position, and there was little opportunity for choice in organization. However, where the ground made such choice possible, there was wide variation in the preferences of individual unit commanders. Staggered line or "W" position, flat diamond, "rough box", oval, horseshoe, and in fact almost every possible shape was used in position organization. Dispersion was emphasized. The 155mm batteries sought from 75 to 100 yards between pieces in all directions. The 105's tried for a 200 -yard front when the ground permitted. One self-propelled M-7 battalion located its pieces in a modified circle whenever possible, with 100 yards between each piece.

The necessity for dispersion, as previously experienced in Tunisia, has rendered voice control by the executive impossible. Telephone communication from the executive to each section was universally

employed. Some units improvised small switchboards from captured enemy equipment, and others used a party line system. In most of the battalions, small wire reels, generally salvaged or captured, were carried on the pieces. Light W-130 wire was found to be excellent for this purpose. Executives and chiefs of section were equipped with head-chest sets.

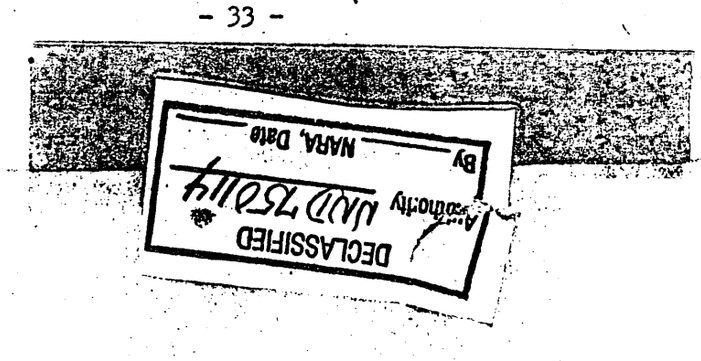
c. Night Operations

Although effective enemy air activity was negligible, a large proportion of artillery movements in the Campaign was conducted at night. The necessity for proficiency in night reconnaissance and survey, night displacement, and night occupation of position was clearly disclosed throughout. The commander of the 10th F.A. Battalion stated that "at least 75% of our reconnaissance for new positions was at night," and about the same figures were given by the 41st F.A. Battalion, whose commander added that "almost every occupation of position was made at night." Similar experience was reported by the S-3 of the 158th who stated that "nearly all our movements, reconnaissance, and also occupations were made under darkness," and in the 171st the S-3 also reported that "it was almost SOP for our battalion to begin reconnaissance for new positions about 3 a.m., after which we moved into new positions just before daybreak." The importance of night operations for artillery was given special emphasis in the report of the Commander of the 9th Infantry Division:

> ". . .Night movement by the front line infantry as was practiced in this campaign entails a closer liaison between artillery and infantry and may often require reconnaissance for position as well as occupation of position during the dark. With no road obstruction this of course is feasible, and with accurate map study on good maps, can be accomplished. . .When opposition becomes more determined, daylight movements will be costly. . ."

d. Fragmentary Orders and Modified RSOP

The use of fragmentary and oral orders, simple and practical SOP for displacement, and avoidance of detailed, time-consuming formal procedure in RSOP were the rule throughout the campaign. Many commanders concurred that the formal procedure as outlined in the training literature on RSOP is effective for basic unit training, but is neither



practical nor real in actual combat operations. As stated by the S-3 of the 45th Division Artillery:

> ". . .Get away from the long, detailed RSOP as given in the book. This standard procedure is excellent to teach officers and men what to do and how to do things in their training period in the beginning. But in combat there are too many unusual and unexpected situations that make any rigid SOP impossible. Standard RSOP as it is laid down in the book is excellent as a guide in training. But it must be modified to suit the realities and the peculiarities of the actual situation. We never use any field orders as such. Fragmentary orders are the rule. Frequently the standard practice in Sicily was to put the batteries on the road, select a position where you could, and tell them to go in and shoot. . ."

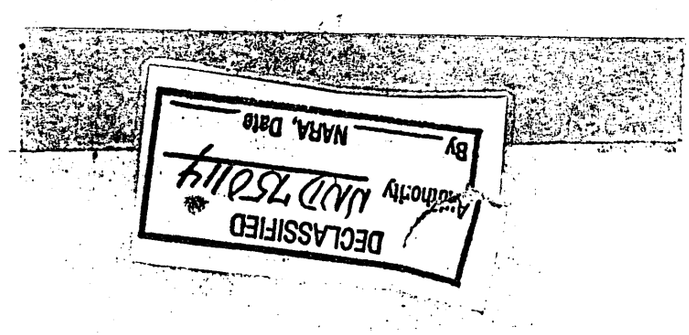
The battalion commander of the 189th F.A. Battalion also commented on this subject and expressed similar conclusions:

> ". . .The old standard RSOP with its 20-odd item verbal field order, the rendezvous of battery commanders' parties, the meeting on the hill, etc., is definitely impractical for combat, at least in the sort of campaign we fought over here. My orders could not have been more brief and fragmentary than they were. We had a practical, flexible, and horse-sense SOP for all situations. All I ever had to give my battery commanders was the general position area and the direction of fire. The SOP took care of the rest. . ."

e. Selection of Battalion Position Areas

In pursuit action, rapid displacement forward was of great importance. Such displacement was expedited by early selection of suitable areas into which battalions could displace without delay as the infantry advance progressed. The artillery commander of the 45th Infantry Division adopted a general procedure that was highly efficient. This procedure was reported as follows by the Division Artillery S-3:

> ". . .In the Division Artillery, general position areas for the battalions were selected by the artillery Commander, the Executive, or the Division Artillery S-3. One of them was continually in the front line infantry area. We generally took eight-hour shifts up there. The one of us up forward would select battalion position areas ahead of time, while the infantry was actually occupying the ground. When the infantry went forward and it was necessary to displace the artillery, the one of us who was up forward would radio in, 'new position areas will be such and such, put the batteries on the road and meet me at new areas.' This system gave quick coordination and very rapid and successful displacement, especially in a situation where we had only one road to use in getting forward. It was a profitable lesson as a result of the campaign. The use of the Artillery Commander, his Executive, or S-3 made



possible the presence on the ground of officers who had authority to move battalions without delay. Subordinate officers would have had to call in, explain the situation, and get authority to move the battalions. This would have cost us valuable time. . ."

f. Reconnaissance

The Campaign demonstrated the necessity for continual, 24-hour artillery reconnaissance vigorously and thoroughly conducted. Route reconnaissance, especially for displacement and for supply, was of the greatest importance. In this connection the Commander of the 10th Field Artillery Battalion stated as a result of his experience that "as soon as a battalion is in position, parties should immediately scour the area for all possible routes for displacement and movement." In Sicily the extensive use of mines, demolitions, and obstacles made this principle even more important.

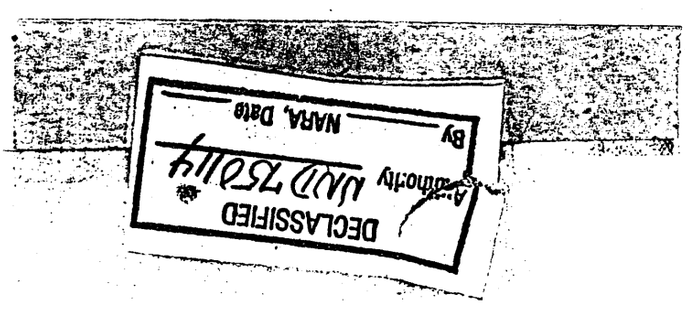
g. Road Traffic Control

The nature of the campaign and the very limited and restricted road nets imposed difficulty in the movement of artillery units. This was especially true in the northern coastal sector, where all communication and supply were confined to a single road. Such conditions brought out the need for a high level of road traffic control in artillery movements. On the whole, this was not fully achieved. Absence of effective enemy air activity was a factor much in our favor, but cannot be expected to prevail at all times. More thorough and intensive training of units in movements and control over limited and crowded roads is necessary.

h. Role of Artillery in Pursuit Action

In pursuit action such as prevailed in Sicily, artillery assumed a measure of importance perhaps even greater than in other types of campaigns. The role of artillery was effectively described by the S-3 of the 45th Division Artillery:

". . .The biggest general lesson of the campaign was the necessity for continuous, aggressive action and employment



of artillery. In a pursuit such as we had throughout, positions must be well forward, and I mean really well forward. On two occasions we had all the division artillery in positions actually ahead of the front line elements of the infantry. You must push forward constantly and push the fire forward all the time to keep the enemy from laying mines and preparing positions. It was the job of the artillery to keep the enemy so hard pressed that he had no breathing space at all, no freedom from continual pounding, and no time to pause and prepare real delaying positions. (The artillery) must fire on him all the time—give him a 'round the clock' shelling with all calibers. This was the outstanding lesson for artillery generally. The rest was the mechanical means of achieving it. . ."

If the letter of the German artilleryman to his family, quoted on page 27 supra, is to be believed, the mission as outlined above was satisfactorily accomplished.

i. Artillery Observers with the Division Reconnaissance Units

In some of the divisions it was recommended that artillery observers should accompany the divisional reconnaissance troops in their operations. Such an observer with radio communication can keep the Division Artillery Commander informed as to the location of the most forward elements of friendly forces, prevent friendly artillery fire from being placed on advanced reconnaissance elements, and locate targets for later fire missions. In advancing situations this observer can also reconnoiter for positions, routes, condition of roads and bridges, and obtain much general information of importance to the division artillery.

35. GUNNERY

a. Principles and Technique

The principles and technique of gunnery as laid down in the Field Artillery School and in training literature were again proven sound. The fire direction center continues to produce excellent results in direction, control, and flexibility of fire.

b. Forward Observation

As in the Tunisian Campaign, forward observation was the principal means of directing and adjusting fire. The mountainous terrain afforded ideal conditions for this method. Approximately 90% of all observed fires were adjusted by forward observers, and the method was also used in static battalion and regimental observation posts. The 189th F.A. Battalion

reported that 77 out of 80 missions fired were adjusted in this manner, and a number of other battalions reported the percentage in the 90's. The forward observers were also invaluable as a primary means of obtaining G-2 information of importance to the infantry as well as to their own units. In commenting on this aspect of the artillery operations, the S-3 of the 45th Division Artillery declared:

> ". . .The success of field artillery in combat depends on the energy, initiative, and capabilities of the forward observers. They provide the most effective means of locating targets and getting fire on them accurately in the minimum of time. We had excellent observers. They got out there like bird-dogs and ferreted out targets and brought down the fire where it did the most good. 90.5% of all fires delivered by the artillery of this Division was conducted by our forward observers. . . They were a most prolific source of valuable G-2 information also. . ."

The Army Commander also reported the following conclusions as a result of experience in Sicily:

> ". . .The liaison officer with an infantry battalion must and should control the forward observers who accompany the assault companies. These observers should report to the liaison officer and get instructions from him and be made conversant with the infantry plan. They should then join the infantry companies to which assigned. Both the liaison officers and forward observers must remain with the infantry for the duration of the fighting and must not attempt to return to their artillery organizations during the night.
>
> The forward observers should remain in contact by voice or runner with the nearest infantry platoon because it is our experience that more than half of the targets fired on by our artillery were picked up by infantry and reported to the forward observers. Similarly, much of the tactical information received by the high command came through artillery channels.
>
> As soon as a position has been captured, the forward observer must report to the liaison officer what probable channels of counterattack he is in position to cover with observed fire. This information is transmitted by the liaison officer to the infantry battalion commander. . .
>
> If the observers from the batteries are in contact, it frequently is possible to stop a counterattack by a combination of percussion and time bursts. I know of only one case where the Germans, stopped by artillery fire, resumed their attack. . .

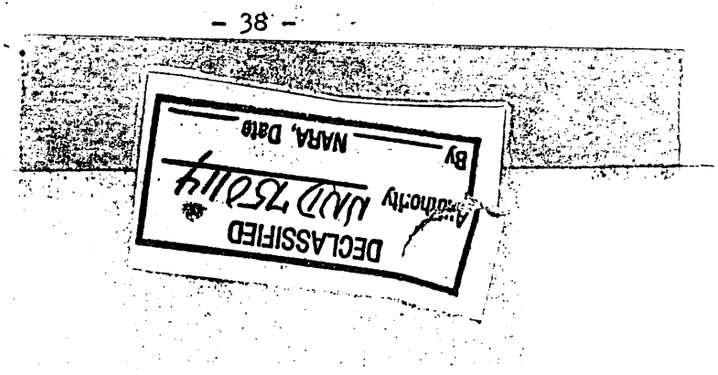
c. Counterbattery

The counterbattery missions were on the whole satisfactory. Accurate location of hostile batteries proved to be the most important element in this phase of operations. The Observation Battalion obtained

good results, and the air-OP aircraft observers were especially useful for this purpose. Two materiel deficiencies detracted from greater effectiveness of our counterbattery fire. The first was the need of longer range weapons for the corps and general support artillery, especially in a campaign in which the enemy was constantly falling back out of range. The 155mm guns of the 36th F.A. were entirely satisfactory, but for counterbattery work, the 155 howitzers M1918 lacked sufficient range. This need of longer range weapons for counterbattery missions was recognized by the Army Commander in his report, and both the Commanding General of the 13th F.A. Brigade and the Commander-in-Chief's personal representative in the battle zone concur that the corps brigade, which should undertake a large percentage of these missions, should be armed with the 155mm gun, the 4.5-inch gun, and the 8-inch howitzer. The second deficiency was the lack of a sufficiently long-burning time fuze for HE shell for counterbattery fire with air bursts. Battalion commanders reported that enemy batteries within fuze-range which were taken under fire with time shell were effectively silenced. The effect of air burst HE was annihilating, but batteries at long range could not be reached with the short-burning fuze available. The mountainous terrain which necessitated high angle fire which increased the trajectories and used up burning time of the fuzes was a contributing factor. The Army Commander has stated that "it is essential that time shell furnished for the 155mm howitzer be fuzed with the M-67 (75-second) fuze." It was also found that white phosphorus mixed with time and percussion HE was highly effective for counterbattery fire.

d. Rolling Barrages

Rolling barrages were fired on a number of occasions with satisfactory results. Seven such barrages are reported fired by five battalions which used standard prescribed methods. These fires were delivered during operations at SAN AGATA, SAN FRATELLO, and in the vicinity of CAPE ORLANDO. Other units reported the delivery of series of concentrations with increasing range which gave the same results as rolling barrages. Experience showed that despite the type of terrain and speed of the campaign, the rolling



barrage was an effective method of fire.

e. Unobserved Fires

Unobserved fires were usefully employed for area targets, fire on airports, and for night interdiction and night harassing missions. In one division a total of 47 unobserved missions were fired out of a total of 363 missions. The accuracy of the available maps, good position survey, and accurate prior registration all contributed to the effectiveness of these fires.

f. Time Fire

As in the Tuniaian Campaign, experience in Sicily again demonstrated the devastating effect of time fire with HE. As a casualty producing weapon and a morale destroyer, it is unequalled. The Commander of the 17th Field Artillery reported:

> ". . .Time fire when properly adjusted is simply annihilating. It was excellent against infantry and equally effective for counterbattery. When targets were within fuze range, we used time fire against enemy batteries with great success. We adjust first with percussion HE and then follow with fire for effect with time shell. We found the FDC works well in correcting height of burst. Once at GANGI we broke up a whole infantry attack with a few rounds of HE. The effect was devastating, and the whole attack folded up. In another instance a strong pocket of resistance in a valley difficult to reach was thoroughly cleaned out by one battalion concentration of time shell. The Germans had artillery with them in the pocket, and a captured prisoner told us that the effect of the fire was positively awful. Four out of five of his gun section were killed by one round. . ."

The need of a longer burning time fuze, treated in detial in subparagraph c, preceding, was felt in all general time fire missions.

g. Flexibility and Massing of Fires

The massing of fires by FDC control was satisfactory and effective. The largest number of battalions massed through the control of a single FDC was seven. The massing of from three to five was frequent practice. As in Tunisia, the flexibility and volume of fire were outstanding factors in the success of the artillery support. The Commander of the 41st F.A. Battalion stated the following in connection with the action at SAN FRATELLO:

". . .The flexibility and speed in delivering the fire of all these battalions (seven through one FDC) was amazing. It was possible by having observers with experience and guts, excellent liaison officer cooperation, and good lateral communication between fire direction centers. . ."

Similarly the Commander of the 58th Armored F.A. Battalion reported that "the results from massed fire cannot be exaggerated. . .The speed and accuracy of the fire are remarkable." Likewise the 9th F.A. Battalion commander observed that "there are no 'bugs' in the system of FDC control. It is the most effective means for fast and accurate delivery of fire that has ever been devised."

36. COMMUNICATIONS

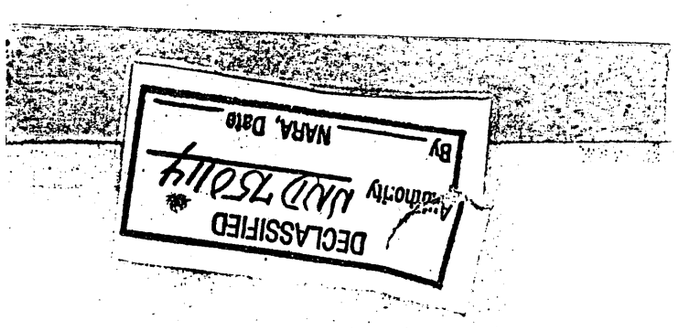
a. General

Despite severe difficulties because of terrain and the rapid advance, artillery communications were generally satisfactory. Radio was the primary initial medium, with wire secondary, in almost all situations. The campaign again stressed the necessity for the highest level of sound planning, cooperation, perseverance, and initiative among signal personnel. The ability to improvise in unexpected and unusual situations also proved important.

b. Radio Relay

The outstanding lesson in artillery communications was the efficiency and effectiveness of radio relay in mountainous country. This system was extensively used for fire control by forward observers, and contributed greatly to the success of these fires. Some units established wire heads as close to the observers' positions as possible, and used telephone to relay messages received by radio from the observers. Others used complete radio relay from observer to fire direction center, sometimes through as many as four stations. Experience of the 45th Division Artillery was reported by the S-3:

". . .Radio relay stations for communication with forward observers were universally used throughout the campaign. We strongly recommend training in their use, and in the relaying of data and observers' sensings. In one case we fired a very rapid and successful counterbattery mission with four radios in relay and one section of wire. The



results were excellent. Between the observer and the Division Artillery CP there were four radio stations working in relay, and from the CP the data were sent to the batteries by wire. . ."

c. Radio Maintenance Technicians

As in the experience of the infantry, the Campaign again disclosed the need of at least one highly trained radio maintenance specialist for each artillery battalion. All units concurred that the inclusion of such a technician in the organization would materially improve and strengthen the efficiency of radio communication.

d. Radio Discipline and Procedure

The importance of the highest level of radio discipline was stressed in all units. Also, a number of commanders recommended more intensive training of all officers in proper radio procedure, especially in person-to-person voice communication.

e. Training of Additional Radio Operators

The extensive use of radio relay necessitated the establishment of additional stations requiring the services of further additional operators. In many cases where additional trained operators were not available, it became impossible to relieve them properly. A number of unit commanders have recommended that additional men in the battalions be trained in radio operation in addition to their primary duties. Drivers of jeeps, command and reconnaissance cars, and radio cars were suggested as the source of these additional spare operators.

37. USE OF ARTILLERY AIR OP AIRCRAFT

a. General

The value and versatility of artillery observation aircraft was one of the outstanding lessons of the campaign. These aircraft were fully effective in carrying out their own primary missions and in addition served in a number of important secondary missions despite the difficulty of scarce and restricted airfields. As reported by the Commander-in-Chief's personal representative in the battle zone,

". . .The Cub plane has proved itself of great value in the conduct of artillery fire. . .(It) was used for many purposes other than artillery observation. For liaison, for the transport of commanders and staff officers back and forth from the front, for reconnaissance of terrain, and routes of communication, it has shown itself to be invaluable. . ."

b. Tactical Employment

(1) In the artillery battalion the principle of organic air observation has proven to be sound. The successful adjustment of artillery fire from the air is dependent upon teamwork built up between the pilot, observer, and the artillery battalion as a result of intensive training together.

(2) The Division Artillery Air Sections used their two organic airplanes for adjusting artillery fire, but it was also found in combat that numerous vital reconnaissance and liaison missions for the division other than artillery observation were demanded of the planes. More missions of the latter nature were required than the two division organic planes could fly. The division artillery commanders employed the reserve planes of the battalions in order to accomplish the additional missions.

(3) The Group Artillery Air Sections employed their planes in the same manner as the division artillery commanders, using the battalion reserve planes under Group Headquarters control.

(4) Because of the scarcity and difficult nature of the available landing fields in Sicily, it was found more satisfactory in many instances for divisions to pool the observation aircraft under division control and dispatch them on call to battalions as missions were required. The efficiency of this system was demonstrated as the solution to the problem of suitable landing fields in mountainous and enclosed country. Its adoption to meet the peculiar situation in Sicily does not conflict with the established principle outlined in sub-paragraph 1, supra.

(5) The OP aircraft were also useful for the conduct of naval gunfire in support of land operations. In one division 9 naval gunfire missions were flown by one plane, and others were similarly employed with success.

c. Operational Technique

(1) Forward observation methods of adjusting artillery fire from the air as now taught in the Field Artillery School have proven to be quick, efficient, and sound.

(2) The technique of flying while observing fire conceived and taught at the Field Artillery School is not practical. Observation cannot be obtained by flying a few hundred feet over the battery position and adjusting fire of that battery on targets three or four thousand yards away. Targets cannot be seen from that distance because our front lines and those of the enemy are always indistinct and difficult to locate even when flying directly over them. It has been necessary to fly up to and over the enemy front lines at altitudes of 500 up to 3000 feet in order to obtain observation required for various missions. Even then the observers needed field glasses in order to locate targets accurately. In many cases along the coast flights were made about 1000 yards off shore in order to adjust our artillery fire on enemy targets several miles behind the enemy lines, adjustment on which would have been impossible by any other means because of terrain obstacles.

d. Communications

(1) In general the SCR 610 installed in the plane has not been satisfactory because of its weight and its short range. A lighter set with much longer range is required, especially for adjusting the fire of medium and heavy battalions.

(2) In order to maintain communication between the division artillery command post and the artillery airfield, an SCR 193 or 610 was generally provided at the airfield to operate on the division artillery command channel. This radio installation was found to be absolutely necessary in Sicily because of the distance between the airfield and the command post and the lack of adequate wire communication.

(3) In one division a number of Air Corps "AM" radio sets were obtained and installed in the planes. These were found to work well, especially with SCR 284's at ground stations.

(4) A radio having increased range is vitally needed by the Corps Artillery aircraft. No missions were flown for either adjustment or surveillance of corps artillery fire because the SCR 610 was inadequate.

(5) It was found that the triangular wing aerial is the most satisfactory. The single line aerial is too directional.

e. Vulnerability to Enemy Action

The artillery observation aircraft were attacked on nine different occasions by several enemy aircraft, but none were shot down. Standard evasive tactics of rapid descent, contour flying, and weaving have been successful. The observation planes were also often subjected to antiaircraft and small arms fire, and though a number were reported to have sustained minor damage, none were shot down.

f. Effect of Observation Aircraft on Enemy Batteries

It was noted throughout the campaign that the mere presence of artillery observation aircraft served to silence enemy batteries. The Germans seemed to fear greatly the accurate fire that these planes invariably brought down on them when their batteries were observed. A good example of this appears in the statement of the Artillery Air Officer, 3rd Infantry Division:

> ". . .We discovered one very effective use of the planes--just put them up in the air and the German batteries would cease firing. Evidently they learned how deadly our counter-battery could be when adjusted with air observation. When our division was moving up west of CAPE ORLANDO, the Germans had heavy interdiction fire on the only road over which we had to advance. We sent up a cub plane to try to locate the batteries. As soon as the plane was up and was apparently seen by the enemy OP's or their batteries, the fire ceased. General Campbell, our Artillery Commander, then ordered a plane kept up all the time, and so long as the plane was in sight, not a single round was fired on the road. . . This was universal experience throughout the campaign.

38. SURVEY METHODS AND OPERATIONS

a. Survey operations within the battalions were largely confined to battery position areas. The 1:50,000 and 1:25,000 maps of the island were exceptionally accurate; and surveying of the target areas was not undertaken. The speed of the advance also influenced the artillery survey

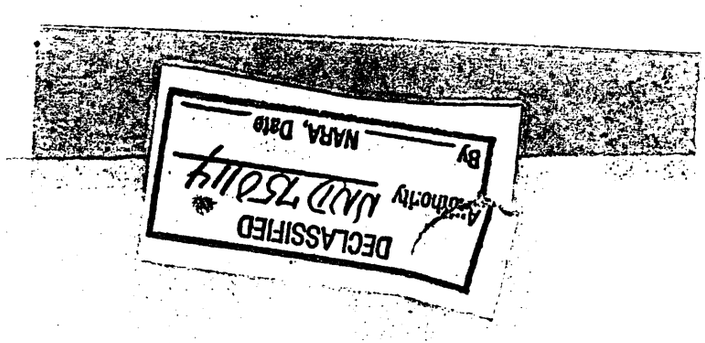
in rendering any detailed or elaborate operations impracticable except for some few instances. As a rule separate or parallel orienting lines were run for individual batteries.

b. Standard survey methods were used throughout with few exceptions. In the 45th Infantry Division, because of metallic debris and possible ore deposit interference with needles, "sun shot" azimuths were substituted for magnetic bearing and azimuths. Detachments of the 1st Observation Battalion furnished these azimuths obtained from sun shot readings, and survey control could be initiated from these basic directional data. It was found that a sun shot azimuth could be computed within 15 or 20 minutes by a well trained survey crew, and the Division Artillery survey officer recommended that this method be taught to all division survey sections. It was also found that Vega tables were the most satisfactory means of computing coordinates.

c. Campaign experience disclosed the need of some form of practical intra-communication within the survey sections of battalions, and inter-communication between battalion and division survey parties. One division survey officer recommended the assignment of two SCR 536 sets and one SCR 610 per battalion and division section for this purpose.

39. CAMOUFLAGE AND CAMOUFLAGE DISCIPLINE

Wide dispersion, defilade, and the use of natural and artificial media properly prepared and arranged are essential for artillery camouflage. The use of nets again emphasized the necessity of suitable garnishing to blend with existing terrain and foliage, and especially care in draping. Nets if improperly draped often give away a position. Some of the Italian prisoners taken in the mountains overlooking position areas stated that the first thing they could spot was poorly arranged camouflage nets. The nets were also found to be very inflammable. Several units reported the loss of vehicles by fire as a result of the nets being fired by HE. Camouflage discipline in the artillery units was generally



satisfactory. Commanders, however, recommended stressing it in the training of new units. The lack of enemy air activity produced a tendency to relax camouflage discipline. It was necessary to take measures to counteract this false sense of security.

40. MISCELLANEOUS

a. Dealing with the Nebelwerfer and Hostile Roving Guns

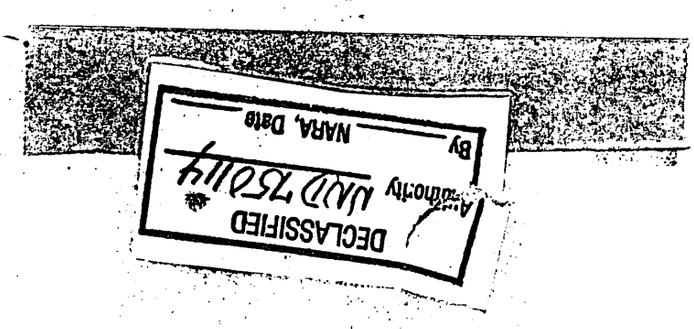
The Germans employed a number of the large six-barrelled Nebelwerfer rocket guns, which were capable of being moved to new positions very quickly after firing. Although their location could be detected by the immense flash--similar to the discharge of a battery of Livens projectors--these guns often changed position immediately after firing. Experience in attacking these weapons was related in the report of the Commanding General, 9th Infantry Division:

> ". . .Attack on the nebelwerfer because of the fleeting nature of the target demands special attention. The nebelwerfer can limber and move out of position within three minutes after a close round--this speed of withdrawal demands either a very rapid adjustment and immediate fire for effect or else adjustment on a point 400 or 500 yards away and a surprise transfer going into effect immediately. Speed and surprise is the only way to catch them in position where you can hit them. One observer reported that while he was adjusting on a rocket gun, and before he could go into effect, the gun was limbered up and got away. Fortunately, however, the rocket gun opened up immediately after from a position only 500 yards away. The observer shifted over going into effect at once and destroyed the gun. . ."

Similar tactics were necessary in dealing with self-propelled roving guns. These weapons would fire for a short while and then change position. They were also difficult to locate. Alert, energetic observers, and quick transfers from check points within limits to insure surprise and sudden fire for effect were the best means of dealing with them.

b. Use of White Phosphorus

White phosphorus shell proved to be highly effective as a casualty agent as well as for screening. It produced a demoralizing and confusing effect on personnel, and was especially useful for burning vehicles and fixed installations. It was employed against a wide variety



of targets with excellent results. A majority of the 105mm battalions used on an average of 25% to 50% of WP, depending on the nature of the missions and targets. The prolonged dry season which rendered vegetation and terrain highly inflammable was a contributing factor in the usefulness of phosphorus.

A number of battalion commanders recommended some form of division control over the use of WP. It was found that where several batteries or battalions were firing into the same area, uncontrolled use of phosphorus often interfered with adjustment because the smoke obscured targets.

c. Training in the Use of Foreign Maps

All maps for artillery use were European, which necessitated familiarization with scales, contour interval, and other features that differ from the maps commonly used in the United States. Many unit commanders strongly recommended more thorough and intensive training of officers and men in the use of these foreign maps before going into overseas theaters.

d. Essential Records and Reports

It is essential that staff officers responsible for the keeping of essential records be trained to do so under combat conditions. This is especially important with regard to artillery ammunition expenditure reports, and the routine S-reports.

e. Declination of Instruments

The presence of large quantities of metallic debris in the zone of operations and in Sicily the numerous outcroppings of ore deposits made accurate declination of instruments difficult. Officers responsible for this function should keep these factors in mind when similar conditions are present and take proper precautions to obtain accurate results.

SECTION V : ARMORED FORCE UNITS

41. GENERAL

a. The experience of the one armored division which operated in Sicily was largely influenced by the terrain and the unusual speed at which the campaign moved. The rugged mountainous terrain and the restricted road net through enclosed country, narrow valleys, and wall-enclosed fields prevented concentrated action of the division as a whole, or any major employment of armor in mass.

b. The major role of the tanks took the form of pursuit action in overrunning and securing the western end of the island, and in assistance to the infantry in relatively small units where necessary. The main operation of the armored division as a whole was the rapid and successful "wide end run" for PALERMO, which involved pursuit action from GELA to the latter city in only three days--a distance of over 150 miles over difficult terrain and in many cases poor roads which were extensively mined and blocked by demolitions and obstacles.

c. The light tanks were especially valuable for reconnaissance and were well adapted to the terrain and the fast moving situation that developed.

d. Unit training in relatively restricted areas prior to the campaign proved of advantage in Sicily. One battalion commander pointed out that the terrain factor on the island actually worked to the advantage of his unit, since previously it had not operated over the wide expanses of ground in southern Tunisia, and the combat training in Africa had been carried on in more or less limited areas.

e. Because of the nature of the campaign and further because the country in the eastern and north coastal (U.S.) sectors was unsuited to armored operations, the combat experience of the armored division employed was limited in scope and was concluded after the capture of PALERMO.

Nevertheless, lessons of value were derived from the operations conducted. These lessons and experiencies are of particular interest and value since they reflect the reaction of armored units which engaged in their first major campaign.

42. SMALL UNIT OPERATIONS

The importance of small unit operations and special missions of companies and platoons was disclosed as a result of the terrain and nature of the campaign. Prior training in this phase of tank action was proved to be valuable, and was so reported by the Commanding General of the 2nd Armored Division:

> ". . .Small unit problems involving the use of a base of fire by supporting weapons and dismounted or tank enveloping force have been emphasized by this Division in all training preparatory to the Sicilian Campaign to such an extent that personnel was most efficient in the technique of this maneuver. The soundness of this training was repeatedly demonstrated by the rapid reduction of pillboxes, defended road blocks, and AT defenses in the advance from GELA to PALERMO. . . ."

In this connection the importance of the platoon in combat and its proper training as a unit was emphasized in the comment of the commander of the 66th Armored Regiment:

> ". . .The brunt of tank action in the final analysis is carried by the platoon. It is highly important to control the platoon properly in combat and fight it as a platoon and not as individual tanks. There is always a tendency for individual tanks to stray in battle. The most important duty of the platoon leader in battle is to keep his tanks controlled and together. Without this control the companies cannot effectively operate and maneuver. . ."

The need for special training in the special operations of light tanks when attached in small units to assist infantry was also pointed out by a company commander of the same regiment:

> ". . .In Sicily the light tanks were often detached and attached to infantry units for special operations. These attached units were generally platoons. . .In a country like Sicily, and in such a fast moving campaign, it was necessary, and it may be necessary again. . .(We) were often attached to reconnaissance units and to infantry for special reconnaissance missions. Our platoons were more or less unprepared for this type of work because we generally work as a company. We did the job all right, but I think it will be better for future operations if special platoon training were given in such operations. .

43. INDIRECT FIRE FOR TANKS

The value of indirect fire methods for tank gun crews was again demonstrated. It was found useful in the hilly terrain encountered and for special missions that often became necessary. A regimental commander reported:

> ". . .All officers and men should be trained to fire with indirect methods. We have found it invaluable in a number of instances. There are times when normal tank action is not feasible, and yet the fire power of the tanks can be used to great advantage."

44. GUNNERY AND COMBAT FIRING

The need for intensive training in gunnery and combat firing was stressed by all commanders. Speed and accuracy combined with effective control by the tank commander were shown to be vital to tank gunnery. A battalion commander of the 67th Armored Regiment stated:

> ". . .We found in actual tank vs. tank fighting, and we ran into some Mark VI's at GELA, that the tank unit that will win is the one that is 'quickest on the draw' and can shoot first and straightest. At GELA we ran unexpectedly into a flock of German tanks, and in the ensuing fight, we were able to knock out six Mark VI's, seven Mark IV's and III's. We attribute our success in this to our better maneuverability, and quicker deployment, and to our superior gunnery. . ."

Likewise the commander of a battalion in the 66th Armored Regiment gave another example from combat experience:

> ". . .At CANICATTI we were fired on by a number of German 90mm self-propelled guns, perhaps ten or fifteen of them, and they were in position and got their rounds off first. But their marksmanship was poor, and they got little effect on us. When we got our tanks into position and opened up on them we were able to outshoot them and knocked out several with direct hits. . .We attribute this successful action to well trained gun crews who fired accurately and rapidly, and to the proper maneuver on the part of the platoon leaders. . ."

45. USE OF THE ASSAULT GUN AND MORTAR PLATOONS

Several units reported excellent results with the assault gun platoons and mortar platoons used as batteries, with fire conducted by forward observation methods. One battalion commander described the following incident in this connection:

". . .Just south of CANICATTI we had a particularly successful experience with our platoons in this method of employment. Our advance had stopped at darkness, and at daylight we discovered a number of 90mm self-propelled AT guns in position ahead of us. We were waiting orders to resume the advance, and in the interval we put our assault gun platoon in defilade position along with our platoon of mortars. The platoon leader went forward with a radio and adjusted fire on these guns with forward observation methods. We knocked out two of them, destroyed a large amount of motor transport in their vicinity, and forced the rest of the guns to evacuate their positions. Some of these guns could not have been reached in any other way. . .We are sold on this method of using our assault gun platoon whenever the situation permits. It has worked out very successfully. . ."

46. USE OF WHITE PHOSPHORUS

As in the experience of the other arms, white phosphorus shell proved to be a most valuable and effective weapon in tank action. A battalion executive of the 66th Armored Regiment stated that "its effect in some cases was deadly--we came across gun crews that had been literally burned to a crisp," and the commander of the same regiment declared phosphorus to be "one of the best weapons we have against all kinds of targets."

47. MAINTENANCE

The vital importance of vehicle and weapon maintenance was again disclosed. The terrain in Sicily and the speed of the movement from GELA to PALERMO imposed an excessive strain on the vehicles. The rocky, mountainous country combined with long marches over rough badly surfaced roads proved to be severly deteriorating to rubber tank tracks, so much so that the Division Commander reported that

". . .Approximately 75% of the tracks were completely ruined on arrival at PALERMO. This rubber track block was of a new synthetic type material and although it had travelled less than 300 miles it was completely worn out, Steel tracks were, generally speaking, in good condition. . ."

48. SUPPLY IN A RAPIDLY ADVANCING SITUATION

The supply of large armored units in an action such as was experienced in Sicily proved to be a factor of first importance in the

success of the operations. This question was summed up in the report of the Commanding General, 2nd Armored Division:

> ". . .The operation against PALERMO served to emphasize the tremendous supply problem involved in sustaining an armored division on the move and in action.
>
> It is estimated that the organic vehicles within an armored division can keep the division supplied as long as the Army rail or truck head is within thirty miles of the combat elements and a reasonable road net exists.
>
> As this Division landed with a very limited number of trucks due to the shortage of shipping, it was able to maintain itself only by a close margin. All trucks hauled twenty-four hours a day, being forced to draw from beach dumps. Due to the rapid movement of the Division, the distance from these dumps increased until it reached 140 miles.
>
> Fortunately ammunition requirements for the operation were not heavy. Had the action been sustained and the demand for ammunition tonnage been heavy, it would have been impossible to have supplied the division with both gasoline and ammunition with the trucks available.
>
> For any operation of an armored division all classes of supplies must be pushed up within 30 miles of the combat elements, or if this is impossible, at least three additional supporting truck companies must be made available to augment the organic transportation. . ."

The proper balance of road priorities between combat troops and supply elements should be maintained. The division commander further reported in this connection:

> ". . .Road priority in some instances was given to combat troops to the exclusion of all administrative vehicles. This delayed trucks carrying gasoline and oil for advanced elements and seriously reduced their combat efficiency. . ."

49. MISCELLANEOUS

a. No provision is at present made in the armored division for handling of prisoners of war. Long sustained advances must be closely followed by line of communication troops to take over the guarding and processing of prisoners and captured materiel.

b. Infantry following rapid tank advances must be continually alert for centers of resistance that have been by-passed or overlooked by leading tank elements. Instances occurred where machine guns held their fire during the advance of armor and opened up on thin-skinned vehicles

following.

c. In many instances antitank guns can be located only by their muzzle flash. Tank crews should be trained to look for and recognize these flashes, and not confuse them with friendly artillery fire falling in the same area.

d. Tanks should avoid or by-pass small towns during rapid advances. Small towns of the type frequently encountered in Sicily could be dangerous tank traps, especially in the narrow streets which afforded little or no observation for the tanks and excellent locations for antitank guns.

SECTION VI : MINE WARFARE AND BOOBY TRAPS -- ALL ARMS

50. GENERAL

a. In the continual withdrawal and delaying action of the enemy, mines and booby traps were extensively used, and constituted a powerful obstacle in the way of the advance. The Germans employed them even more freely than they had in Tunisia except in places where they were so hard pressed that there was insufficient time for them to prepare mined areas.

b. The general pattern of German and Italian mines in Sicily was fairly similar to that employed in Tunisia, though mines were laid in greater numbers and with somewhat greater irregularity. There was a general absence of extensive antitank minefields such as were laid in the open stretches of Southern Tunisia. The most heavily mined areas were generally in and about the approaches to demolitions and blown bridges. Roads and all available avenues of pursuit were thickly strewn with mines of all types. Constant withdrawal gave the enemy the advantage of complete knowledge of the terrain into which our troops had to move and occupy positions. As a result, nearly all likely position areas for artillery

and infantry were thickly sown with mines and booby traps whenever there was time to lay them.

c. Antipersonnel S-mines were especially troublesome and were used in huge quantities. Whenever there was time, booby traps of every form, from ammunition dumps to attractive souvenirs, were prepared. It is reported in the British sector that an inviting cellar filled with whiskey and gin was so effectively booby-trapped that the entire building housing it had to be destroyed by engineers and bomb-disposal personnel. It is also recorded that the Germans booby-trapped the dead, some of which were partially buried, in order to produce casualties among troops conducting burials.

d. The one major lesson of the campaign was an emphatic repetition of the lesson in Tunisia, the fact that mines are a menace to troops of all arms and services in the combat zone, and their detection, disarming, and removal are no longer special functions of the Engineers. The infantry, artillery, armored forces, reconnaissance units, and in fact all troops who passed through or occupied areas evacuated by the enemy were exposed to mines and booby traps. All units were unanimous in their praise of the work of the engineer troops for having done an efficient and highly satisfactory job in clearing the main avenues of advance. But it was conceded that the Engineers could not be expected to clear all the areas containing mines and booby traps that had to be occupied during the advance. The obvious solution of this problem is sound training in mine detection and removal for troops of all combat arms and services. A penetrating estimate of the training needs with respect to mine warfare was given by an artillery battalion commander who declared at the close of the campaign:

> ". . .All soldiers, regardless of arm or service, should be trained in defense against mine warfare. It should be just as much a part of the soldier's basic training as gas mask drill and defense against chemicals. Both mines and gas are similar in that they are common menaces to all troops in the combat zone, regardless of arm or branch. . .Men are given basic training in defense against chemicals, are taught how to identify the various gasses, how they work, and measures of protection against them. . .It is equally important that all combat troops in their basic instruction be given similar instruction in defense against mines. They should

be taught to identify mines, how they work, and the proper measures of protection against them. While the main burden falls on the engineers, the other arms are often exposed to the mine menace in many areas that the enginners cannot reach. You cannot expect the engineers to be everywhere at once and clear every area and position you will have to go into. The answer is, train all troops to take care of themselves. . ."

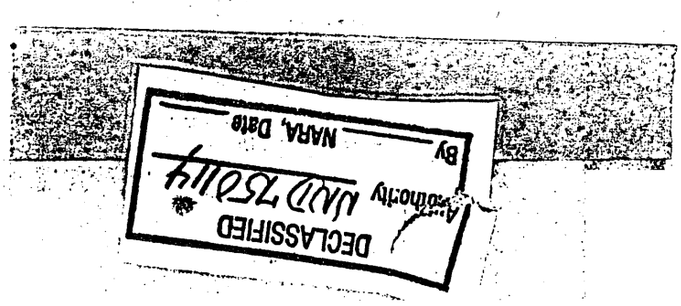
51. LESSONS AND EXPERIENCE FROM INFANTRY UNITS

a. Foot elements must be capable of continued advance through mined areas, and not wait for engineer assistance in clearing areas. As stated by the Commanding General of the 9th Infantry Division in his report:

". . .Infantry must move forward cross-country removing mines themselves. . .Each rifle company must have organically at least three mine detectors which are kept forward with the company, and all personnel should be trained in removing mines and booby traps. Care must be taken in by-passing road blocks and blown bridges. They are always mined. . ."

b. In both training and operations there must be a cooperative effort between both infantry and engineers in clearing main routes of advance. The infantry must protect the engineers in their mine clearing operations, and there must be a complement of engineers with the forward elements of the advance guard.

c. Several methods of dealing with the mine menace by infantry were carried out. A number of units had sent officer and NCO cadres to the Fifth Army Engineer Training Center prior to the invasion of Sicily. These graduate cadres in turn held unit schools of instruction which were effective in training all ranks. Other units organized special mine clearing detachments which were trained by their own organic engineers. In some regiments special detachments of 50 men were trained in this way and kept in reserve to be used whenever needed. In all organizations regardless of how the problem was met, officers testified to the vital importance of thorough mine training for infantry, and the Army Commander declared:



". . .In training, the detection of mines by all types of troops must be stressed, and each infantry company should be provided with ten mine detectors. . ."

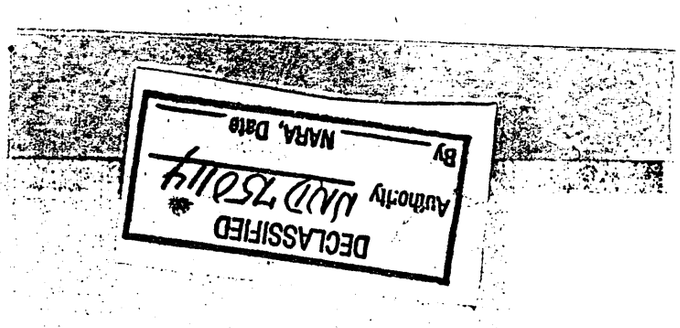
d. The worst menace to the infantry was the antipersonnel S-mine. The larger tellermines were not so dangerous to the foot troops unless booby-trapped with trip wires, but the S-mines because of the profusion in which they were sown and the difficulty of detecting them, constituted a constant menace and a source of many casualties.

52. LESSONS AND EXPERIENCE FROM FIELD ARTILLERY UNITS

a. Limited battery position areas and restricted routes of movement in country evacuated by an enemy fighting a delaying action made extensive mining of nearly all potential battery positions a common occurrence. The withdrawing enemy habitually mined all likely battery positions whenever possible, which resulted in continual exposure of artillery units to mines. The necessity for sound training in clearing under these conditions was of great importance. In this connection the Seventh Army Artillery officer reported:

". . .Extensive enemy use of land mines in defensive and delaying operations has made it essential that Field Artillery units be equipped with mine detectors to avoid heavy personnel and materiel losses when occupying positions. Engineer personnel is normally not available for this purpose, since road clearance and other missions have a higher priority than clearing artillery position areas. Authority has been secured for the issue of mine detectors to field artillery units in this Theater on the basis of one per headquarters battery and three per firing battery. It is recommended that tables of equipment be modified to allow these mine detectors for all field artillery units, including especially those in the U.S., to permit necessary training of artillery personnel in their use. . ."

b. Sweeping of battery positions should be a continual, progressive process, until all places of necessary troop activity have been effectively cleared. An armored battalion commander stated that "when we first go in, we sweep the route for the gun and its immediate position. After the guns are in, we then continue sweeping, extending out to cover the whole area."



c. As in the infantry, various methods of organization were employed. In some battalions, special mine clearing detachments were organized within each battery. In others, special battalion sections were trained and used as required among the batteries. One armored battalion reported that "we are training the AT sections, the reconnaissance section, and all NCO's of staff sergeant grade and above." Another battalion commander stated:

> ". . .In Sicily we found that there was very little use for the battalion antitank platoon. We took 20 men from this platoon and organized them into a mine clearing section. We borrowed instructors from the engineers and trained them in the use of detectors and in disarming and removing mines. This section did good work all through the campaign. It is now holding schools and is training 20 men per battery, so that we will eventually have each unit well prepared to take care of itself. When we go back into action I can take forward the clearing section and hold it handy while we reconnoiter new positions. It can start clearing these positions while the batteries are coming up. . ."

53. LESSONS AND EXPERIENCE FROM ARMORED FORCE UNITS

Although the armored division that participated did not have to fight its way through extensive minefields such as were experienced in Tunisia, the heavy mining of roads, by-passes, and areas that had to be traversed and occupied revealed the need of thorough training in detection, clearing and removal. The Commander of the 2nd Armored Division summed up this principle in one sentence: "Training in mine removal must be conducted for all ranks."

54. MISCELLANEOUS

a. Types of Mines Encountered

The types of mines encountered in Sicily were largely confined to the familiar tellermines of several models, Italian box mines, and standard German and Italian antipersonnel mines. In the later stages of the campaign a considerable number of wooden mines were used by the Germans. This type proved to be as effective as the metal mine, but could not be discovered by means of the detector. Prodding

served as the only means of detection. Only one plastic mine was reported throughout the campaign. It is to be expected that this type will become more prevalent in future operations.

b. Effectiveness of Enemy Mine Operations

The campaign demonstrated that the land mine can be a most powerful weapon in delaying action. When used extensively in terrain such as prevailed in Sicily, its effect in delaying the advance of forces must be recognized as a problem of first importance. Plans and training to meet this problem must be carefully accomplished in preparation for future operations under similar conditions. The Commander of the 1st Infantry Division reported:

> ". . .The Germans proved that in mountainous terrain, contact with an enemy can be broken by the use of mines and demolitions with long range artillery fire covering the minefields and demolitions. . ."

That the German use of mines will be greatly expanded in the future there can be no doubt. As the enemy is forced to withdraw from occupied territory toward his own soil, we must expect a more extensive use of land mines and even greater mechanical efficiency on the part of his mine weapon. The enormous quantities of mines that can be produced at relatively small cost in comparison to other weapons, and their proven effectiveness in defensive warfare indicate that the problem of dealing with the mine will become more and more serious as the war progresses to its final stages. All personnel of all arms must be conscious of the problem, and the best thought and resourcefulness of all concerned must be devoted to its solution.

The actual casualty effect of enemy mines in the Campaign has been difficult to determine. Since most mine casualties are fatal, and the causes of death on the battlefield are not classified, it is not possible to state the exact percentage of casualties from mines. The Army Commander has estimated that approximately 10% of the losses were caused by mines. In one field artillery battalion the figure was given as high as 30%, though this appears to be an unusual case.

c. Passage of Mined Beaches

In landing operations the rapid passage of mined beach areas is of grave importance to the success of such operations. In Sicily the landing operations revealed the need of a higher level of training, discipline, and technique in crossing mined beaches. The Commander of the 1st Engineer Special Brigade has reported on this subject:

> ". . .More casualties were caused by mines than were necessary. Men and vehicles would have been saved had there been more thorough instruction in mines, had there been better discipline, and had there been better control and direction. Traffic must be confined to cleared areas. Mine detectors must be divided among the craft and not collected in one boat and sunk all together as happened in one instance. . ."

d. Sandbagging of Vehicles

As in the experience in Tunisia, the value of sandbags in vehicles was again demonstrated. Although they do not prevent damage to vehicles, they frequently save lives. One infantry officer declared that "the truck driver should regard his sandbags as a rifleman does his rifle."

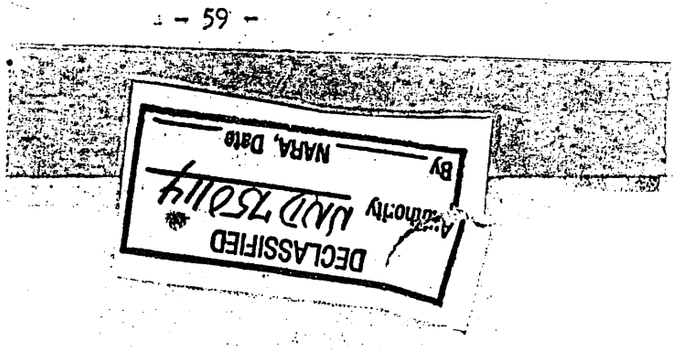
e. Avoidance of Souvenir Hunting

Troops, especially those engaging in their first action, must be taught to avoid attractive souvenirs. Many objects which appeal to the soldier as desirable mementos are cleverly booby-trapped. An infantry battalion executive whose unit fought for the first time in Sicily reported:

> ". . .You must train men to stop souvenir hunting. The Germans are fiendish at setting out these attractive nuisances, and untrained men often get caught. We find that new troops after their first fight seem to forget that the war is still going on, and set out to get a lot of souvenirs. They often get blown sky high in doing so. . ."

f. Avoidance of Riding on Running Boards and Fenders

There have been instances of officers and men who were killed as a result of riding on the running boards or fenders of vehicles when mines were run over. Other personnel in the vehicles were unhurt or sustained only minor injuries. This practice should be strictly avoided.



g. Multiple Laying of Mines

Troops must be made familiar with the German habit of laying several mines in the same pit. Often when a mine is detected and removed, another or several others may be buried below the one removed. In clearing, removal parties must be alert to this possibility. Re-check with the detector after the removal of the first mine is one way of detecting others.

h. Avoidance of Uncleared Areas by Vehicles

Drivers of vehicles should be especially careful to follow only cleared lanes and roads. Instances have been recorded frequently in Sicily where trucks were pulled off the roads after the engineers had cleared only the road and not the shoulders and areas adjacent to them. Wrecked vehicles and casualties resulted in such cases. Such areas should be plainly marked to the effect that the road only has been cleared, and drivers must be trained to obey the warnings to the letter.

SECTION VII : AIR SUPPORT AND AIR-GROUND COOPERATION

55. GENERAL

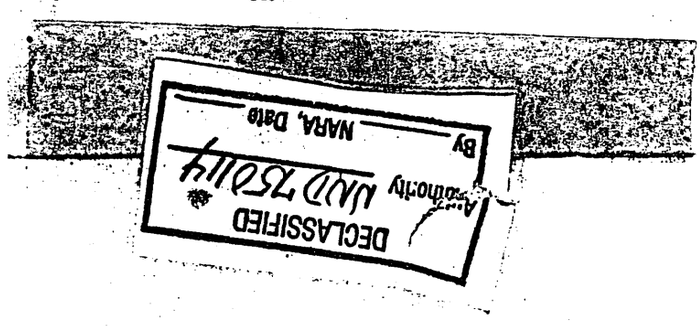
a. The Sicilian Campaign demonstrated the tremendous striking power of air and ground forces when the two are carefully coordinated and work in close cooperation. At the same time it was clearly shown that the achievement of coordination necessary for fully effective operations is difficult and requires meticulous planning, proper training of both arms in cooperative action, and thorough mutual understanding of the problems of each arm. The results in Sicily varied with the attainment of these elements. In general, campaign experience showed that improvement is necessary in certain phases of air-ground support and cooperation.

b. The first phase of air support, the elimination of hostile air activity or reducing it to the control of our own air forces, was

effectively carried out. Allied air superiority was complete and became a powerful influence over the success of ground force operations. This phase is purely an air force function and does not involve the problems of air-ground cooperation and coordination.

c. The second phase, the bombing of objectives ahead of the ground troops to neutralize enemy activity that can hinder our action and to dislocate enemy action becomes a cooperative operation. The ground force commanders indicate to the air force targets that will be best suited to these ends, and a bomb line is established for the protection of ground forces. The bomb line should be selected with an added safety factor if necessary, and should be delineated after consultation between responsible officers of both arms. It should also be capable of clear identification on the actual ground, and this identification should be made certain by practical means of supplementary marking in addition to unmistakable landmarks, agreed upon by both arms. In Sicily the second phase was effectively accomplished in most instances, though there were occasions when bomb lines were undershot and elements of our own forces were mistaken for enemy by the friendly bombers.

d. The third phase, close-in bombing of objectives in conjunction with and directly ahead of a ground attack, is the most difficult of all three phases to carry out. Successful operations of this nature require the highest level of coordination, timing, and preparation between the two arms, and to achieve the fullest success, prior training of both in cooperative action is believed necessary. In Sicily, the close-in bombing operations in support of ground troops varied considerably with respect to the success achieved. In some instances the bomb line was undershot, and friendly troops were subject to attack by our own air force; in others the degree of cooperation and support was outstanding in its effective assistance to the ground troops. This experience from the ground force point of view was briefly stated in the report of the Commanding General, 1st Infantry Division:



". . .During the initial stages of this campaign it was not uncommon to have our own air corps bomb or strafe our own troops, and in some cases, behind the Division command post. Missions which called for close-in bombing of the enemy often brought bombs on our troops. An attempt was made to rectify this by sending a Division staff officer to the airport with a radio and having the air corps reciprocate by sending pilots to the Division command post with communication direct to the planes.

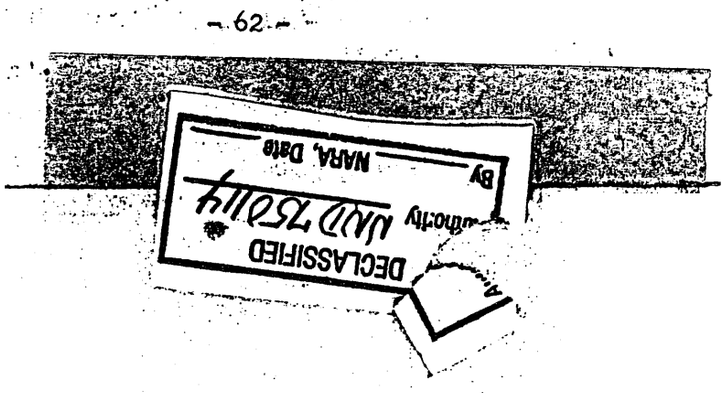
The air corps was most willing to cooperate, and in the attack on TROINA a closely coordinated air, artillery, and infantry attack went off with clock-like precision. The effect of this close coordination on the enemy was temporary complete demoralization. The following day the Germans commenced their withdrawal from TROINA.

The moral effect on the American soldier in seeing air (forces) supporting him in his small battle, and the devastating effect it has on the German soldier makes every effort for close coordination of the infantry and air arm a matter of utmost importance. . ."

The Army Commander has pointed out in his report that one of the best means of insuring success in close-in support action is to provide special training of air units with ground troops, in order that both arms may develop full understanding of the problems and workings of the other. Such training can serve to prevent either arm expecting too much of the other, and thus would produce a greater degree of cooperation. The same report pointed out that "ground troops have a tendency to expect more prompt assistance. . . than is always possible. They must be taught that it requires quite a while to mount an attack with appropriate bombs, etc. . ."

56. GROUND IDENTIFICATION BY PILOTS

a. The instances in which friendly troops were mistaken for enemy and were attacked by our own aircraft resulted from a number of possible causes, the basic one being improper identification of the troops attacked. It is essential that the air arm be furnished with accurate locations of friendly troops, and care must be exercised that these locations do not change in the interim between the stated location and the arrival of the aircraft over the areas. Likewise it is essential that the bomb line which marks the safety limit of action near our own troops be clearly and unmistakably capable of accurate identification by the pilots. Several methods of insuring the latter condition can be adopted:



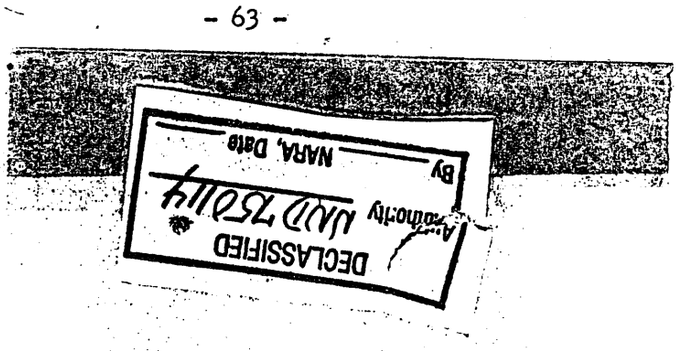
(1) Prior agreement which delineates the line by a series of unmistakable landmarks so positive of identification that they can be readily recognized by pilots at the high speed that the aircraft operate.

(2) When such landmarks are not available, or are not of such character as to insure no possibility of mistaken identity, assistance by the ground forces through the medium of artificial landmarks or supplements to existing landmarks. These may take the form of broad white letters or symbols by pre-agreement, in sufficient size to admit of no mistake as to their identity. Such letters or symbols should at least be 100 yards in length or width. Other expedients that may be adopted are the felling of trees in a symmetrical or recognizable pattern, the marking of specified cross-roads or road junctions with lime, whitewash, or other media, when there is a possibility of the roads in question being confused by pilots at high altitude flying at great speed.

(3) For night operations, identification may be accomplished by the use of lights arranged in pre-selected pattern.

(4) The positions of forward elements of ground troops are normally marked by colored smoke. At present yellow smoke has been used as the standard color for friendly position identification. In a country like Sicily at the season when the campaign was fought, withered and yellowed foliage and large areas of wheat and other yellow grain can be easily be confused with smoke of this color when observed at high altitudes. It is reported by elements of the 2nd Armored Division that some of their units were bombed by friendly planes despite their display of yellow smoke to signal the presence of friendly troops. Whether the smoke was mistaken for the natural elements above mentioned is a matter of speculation. However, the Air Corps has recognized the danger of confusing yellow smoke with other material, and recently stated in a current operational bulletin:

> ". . .For marking the bomb line, colored smoke is most satisfactory provided that red or orange color is used and the smoke volume is heavy. Black smoke is useless for battle



areas and yellow smoke is too easily confused with grass and brush fires. . . ."

It is likewise possible that the smoke grenades now used, such as were employed by the armored units above, do not produce sufficient volume of smoke, or do not build up their clouds in sufficient time.

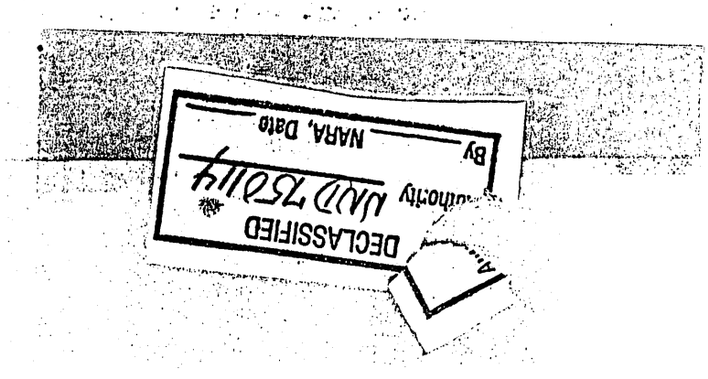
(5) Battle action produces a variety of smoke and dust clouds. White phosphorus smoke when commingled with dust clouds created by shellfire can also be confused with yellow identification smoke. Because of the possibilities of such confusion, prior training of pilots in the observation of smoke signals in an area containing smoke and dust similar to battle disturbances is believed to be valuable.

57. AIRCRAFT IDENTIFICATION BY GROUND TROOPS

a. The problem of identification of aircraft by ground troops has thus far not been satisfactorily solved. The use of such training aids as silhouettes, special schools in aircraft identification, training films, and 'playing cards' have all been emphasized in the instruction of ground troops, but it is recognized that the results have not been of the level required. Ground troops continue to open fire on friendly aircraft and this occurred in Sicily.

b. An effective system of control of fire from ground troops on aircraft must be devised. Troops must be disciplined and trained to withhold fire until they are certain from hostile action that the planes are not friendly. Conversely pilots must avoid flying over ground troops in such a way that may lead the troops to mistake them for enemy. With reference to the landing operations in Sicily, the Commanding General of the 34th Coast Artillery Brigade (AA) reported:

> ". . . .It was evident that some system of fire control for all units must be devised. Time after time ground troops and naval vessels would open fire on friendly planes. Upon recommendation of the AA Group Commander, the --th Infantry Division directed that ground troops other than AA would fire only if directly attacked. . . .In some cases the (friendly) pilots themselves were at fault by flying low over the ships or diving in the vicinity of the ships. . ."



The AA Brigade Commander also recommended that "types of friendly and hostile aircraft expected to operate in the area (involved in an operation) must be made known in time for intensive study by all troops."

58. AERIAL PHOTOGRAPHY AND RECONNAISSANCE

a. The campaign disclosed the need for better provision for the procurement and rapid dissemination of air photographs. The chief difficulty experienced was slowness in production and issue of the photographs in a moving situation. Frequently by the time the prints were in the hands of the units, the situation had changed and the photographs were no longer useful. The Commanding General, II Corps, reported:

> ". . .The provisions for aerial photography, both for intelligence and for artillery use, were not satisfactory in this campaign. Provisions must be made for quicker dissemination of intelligence photographs. Unless wide-angle photographs are provided for artillery use, the methods now taught at the artillery school should be abandoned, in spite of the fact that such methods are highly efficient. . ."

b. The experience of the Seventh Army Photo Liaison Section in securing artillery intelligence from air photograph interpretation sources was satisfactory. The Artillery Officer, Seventh Army, reported:

> ". . .A photo liaison section of an officer pilot and an enlisted man was attached to the Photo Interpretation Unit of the Seventh Army for the (Sicilian) operation. Its mission was to secure artillery information from air photograph interpretation, and forward it directly to artillery units. It also received requests for special artillery missions and transmitted them directly to the Photographic Squadron. . .Photos and photo interpretation reports were flown by officer pilot to II Corps. A total of thirty-eight missions was accomplished. This service proved invaluable in the dissemination of vital artillery information, especially the locations of hostile batteries. . ."

c. The need for closer cooperation between reconnaissance aviation and the ground forces was disclosed throughout the campaign. The Commander of the 45th Infantry Division reported that the results of air reconnaissance in conjunction with the operations of his units were not satisfactory. Missions requested could not always be carried out, and at times when reconnaissance missions were flown, the results

were received too late to be used effectively. The II Corps Commander also recommended closer cooperation between the A-2 of the responsible air organization and the G-2 of the Division for whom the missions are flown.

SECTION VIII : RESULTS OF EFFECTIVE UNIT TRAINING

59. One highly significant lesson and conclusion is clearly evident from the Sicilian Campaign. Units, especially those of the divisional level, which have had sound and thorough training in preparation for combat demonstrated in exemplary manner that they can be capable of highly successful operations against veteran enemy troops in difficult terrain under severe conditions not previously experienced. Several of the divisions that took part in the assault on Sicily and participated throughout the campaign that followed had had no previous combat experience. These divisions acquitted themselves in excellent style and conducted their operations with a degree of combat efficiency comparable to that of the veteran units of the Tunisian Campaign. The reason for this high degree of success on the part of units not hitherto in action can be attributed only to the excellence of their leadership, prior training, and preparation for combat.

60. That combat experience is the best and ultimate form of unit training cannot be disproved by any campaign. But our experience in Sicily shows beyond question that sound pre-combat training can properly fit any organization for battle, and can produce results such as were attained by the divisions referred to above. Conversely a poorly trained unit cannot learn profitably by combat, since it is not prepared to make the most of the battle experience it receives and the confidence that battle experience imparts to the soundly trained organization.

61. There may arise a mistaken notion that much of pre-combat training is not effective because in the final analysis troops can learn only in battle. Such a notion has been thoroughly exploded and disproved by actual experience in Sicily. The divisions that relentlessly drove the German veterans from the Island learned much from the campaign, but without the sound training they displayed initially, their task would not have been so well accomplished.

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NOTES AND LEMORANDA

War is Hell!
Yes, but store this information in your head you may need it someday -